

MOTOR AGE

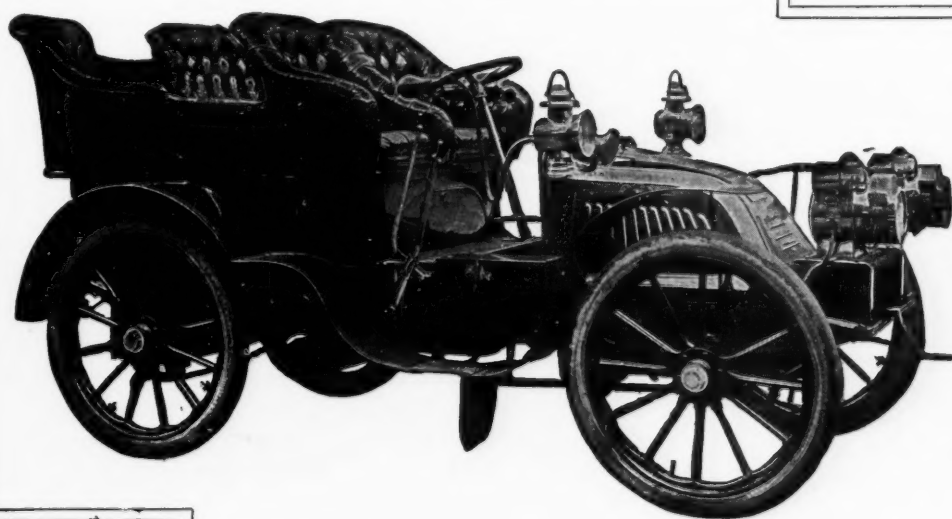
Vol. 4 No. 1

JULY 2, 1903

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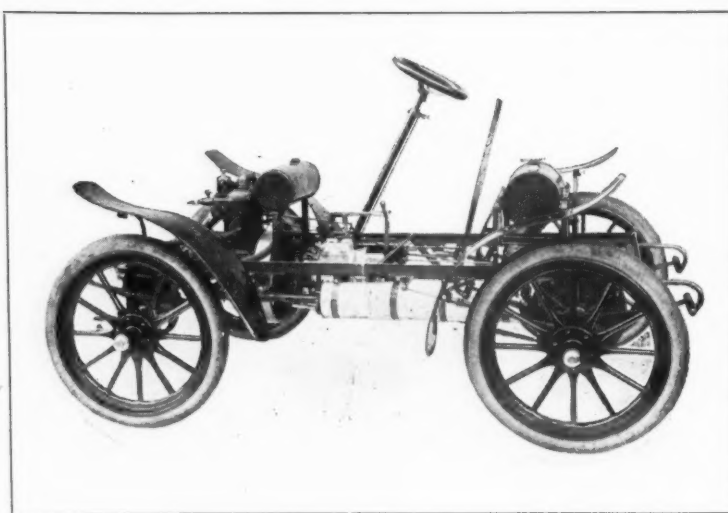
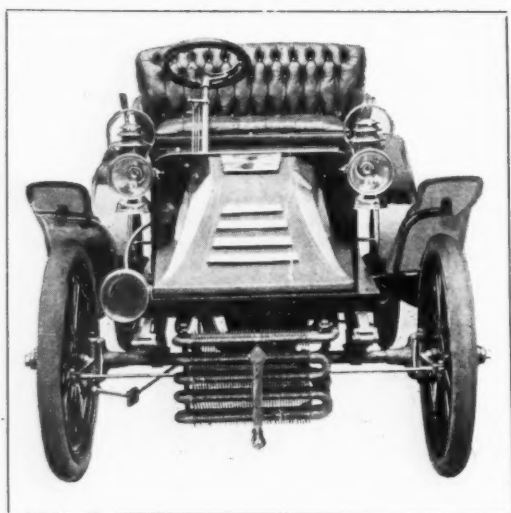
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ANNOUNCEMENT

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ABOVE cuts show our perfected car on which we are now making deliveries. A glance will show up-to-date construction in every part as well as the completed vehicle. There is no car in this country selling at the same price which can be compared with it in workmanship, material and operation. We invite the closest inspection on every part entering into its construction, as well as the details of our assembling. Columbia lock-nuts used throughout. The motor we have manufactured in large numbers for over a year, and every part we guarantee to be interchangeable. The bevel gear transmission is the acme of perfection of the sun and planet type.

It is hardly necessary to say anything concerning the Longuemare carbureter which has been on the market over six years, and 20,000 are in use. We use the best spark and coil plug that money can buy, automatic lubricator feeding engine and transmission, strongly constructed brass trimmed hood.

Remember we are not a new firm offering the trade an experiment, but bear in mind that Holley motors broke the one mile world's record at Pan-American Exposition, Buffalo, 1901, and also won the Boston-New York test, July 4-5, 1902. Why not run down to Bradford and take a ride over our boulevards? (Mud 2 ft. deep.) It will cost you some time and money, but you will certainly know what you are buying. Our agency list is growing daily.

Holley Motor Company, EARL HOLLEY,
Sales Manager **Bradford, Pa.**

tech

MOTOR AGE

VOL. IV. NO. 1.

JULY 2, 1903.

\$2.00 Per Year

GERMANY GETS THE GORDON BENNETT CUP

Ballyshannon, Ireland, July 2—[Special Cablegram]—Jenatzy on a Mercedes is winner of the international race and the Gordon Bennett cup goes for a year's keeping to the German Automobile Club. The man with a "name like a sneeze" finished second to Rene de Knyff at 5:36 p. m. today, the veteran French racer having completed the 368-mile trip 2 minutes before. But de Knyff started at 7:07 in the morning and Jenatzy at 7:21; hence the latter made the best gross, uncorrected time by 12 minutes. His total gross time was 10:15, giving a total gross running speed of 35.9 miles an hour. To secure the corrected running time and rate per hour, however, the time spent in the seven controls through which the cars were allowed to run no faster than 14 miles an hour, must be deducted.

Jenatzy's performance is somewhat of a surprise in that he drove one of the 60-horsepower Mercedes racers which were undestroyed by the disastrous fire of 2 weeks ago in which the 90-horsepower cars originally intended for the race were burned.

ALL READY TO RACE

Ballyshannon, Ireland, July 2—[Special Cablegram]—The fourth annual race for the international cup offered by James Gordon Bennett was started here at 7 a. m. sharp today in fine weather. S. F. Edge, English holder of the cup, was the first starter.

The contestants were: S. F. Edge, Rene de Knyff, Alexander Winton, Baron de Caters, Charles Jarrott, Henri Farman, Percy Owen, Foxhall Keene, J. W. Stocks, Fernand Gabriel, L. P. Mooers and Jenatzy.

The total distance of the course is 368 miles and 765 yards, as measured by a surveyor. It is laid out principally in County Kildare, the start and finish being at Ballyshannon cross roads, about 35 miles southwest of Dublin. In outline the course somewhat resembles a map of Africa divided into two parts, which are known as the major and the minor loop.

The distance around the smaller loop is about 45 miles and 102½ miles around them both and there is a dividing stretch of about 13 miles that must be covered six times in going three times around the combined loops. The small loop is covered first and then the racers go three times around the combined loops.

GREAT CROWD ON HAND

Long before dawn hundreds of police patrolled the usually quiet country roads, which early in the day were alive with a continuous stream of motor cars.

When the pilot car left shortly after 6 a. m. the thirty stands surrounding Ballyshannon were becoming crowded with gayly dressed men and women, many of whom had spent the night in tents, which had been erected in all directions.

ORDER OF THE START

Edge, preceded by a pilot car, got off at 7 o'clock sharp amid the cheers of the spectators. At 7:07 a. m. de Knyff's blue car went flying after Edge, who had long since disappeared in a cloud of dust.

JENATZY ON A MERCEDES CAR WINS THE INTERNATIONAL RACE SAY UNOFFICIAL RETURNS BY CABLE

Winton was not ready when called as third starter, and Owen took his place, the first American car making a rather poor start at 7:14. Loud cheers and waving of hats and handkerchiefs marked his departure. He expressed satisfaction with the roads.

Germany's first representative, Jenatzy, started at 7:21. Then came Jarrott, the English favorite, who got off at 7:23, smoking a cigarette.

WINTON GETS AWAY LAST

Gabriel, who is the favorite, followed Jarrott at 7:35 in a blue Mors like that driven by him in the Paris-Madrid race. Mooers, the second American starter, made a bad departure at 7:42, his chauffeur having to push the car.

Baron de Caters, German, got off at 7:49 with a good start. Stocks, English, was off at 7:56.

Winton had some trouble with the machinery of his car. He was delayed, and it was feared he could not compete.

Farman, of the French team, started at 8:03 a. m.

Winton shoved his machine over the starting line at 8:10 a. m. in order to partake if he were able to effect repairs.

Foxhall Keene was off last, at 8:17 o'clock, with a poor start.

Winton had considerable difficulty with his car, but finally got away at 8:50, amid loud cheering. It was not thought likely he would be able to make up for such a great loss of time.

THE FIRST LAP

Edge repassed the stand of the club first at 8:23, unofficial time. De Knyff passed at 8:34, unofficial. Edge thus gained over 3 minutes on the first lap over de Knyff. Edge was nearly 7 minutes ahead of the time expected. He was going splendidly and flew past the stand at the rate of about 60 miles an hour. The crowd cheered wildly.

Owen passed the stand at 8:49. A few yards behind came Jenatzy. He was trying to pass the American and there was terrific excitement as both flew under the arched grand stand. The American was lost sight of in the dust, but evidently would be passed when the German got room.

Jarrott passed at 8:54, not going very well. When Jenatzy came down the hill approaching the stand in pursuit of Owen he was moving at a speed of about 75 miles an hour. The large crowds arose and yelled frantically. Ga-

riel passed at 9:05, doing the mile ending at the stand in 52 seconds.

Baron de Caters passed at 9:18, having caught up to and passed Mooers. Farman came next at 9:28. Foxhall Keene came flying along ahead of Mooers, and Stocks at 9:40. He whizzed past, making one of the best-timed miles so far in 53 seconds.

Foxhall Keene was leading the racers on time for the first lap. Winton passed on his first round at 10:24.

TWICE AROUND

Edge passed on second round at 10 a. m. Mooers arrived on his first lap at 10:10. It was reported he had trouble with his speed gear near Athy. Stocks, who had not yet arrived, was reported to be out of the race. De Knyff passed on his second round at 10:08 o'clock.

STOCKS DROPS OUT OF RACE

J. W. Stocks, of the English team, broke a wheel on his car and retired from the race. He ran into a corner near Carlow. Owen also damaged his car, but continued hanging on to Jenatzy with grim determination. He passed on the second round at 10:24 o'clock, four minutes behind Jenatzy. Gabriel came along on his second lap at 10:25 and Baron de Caters at 10:55.

JARROTT SPILLS

On the third round Jarrott overturned in making a corner at Stradbally. His chauffeur was badly hurt and Jarrott, of course, retired. He was not seriously hurt, however, a dislocated shoulder being said to be the extent of his injury.

Edge met with an accident near Athy, but soon after resumed the race.

ON THE LAST TRIP

De Knyff started on his third lap at 11:25, having overtaken Edge. Keene was second, starting on his third lap at 11:35, having lost a good deal of ground. Jenatzy was third, starting on the third lap at 11:37. Edge started on his third lap at 11:56, and Gabriel started on his third lap at 12:06.

Foxhall Keene retired from the race in the third lap. He found that an axle of his car was breaking and that the motor was out of control.

Winton began his second lap at 1:28 p. m. Mooers at this stage of the race was reported to have retired.

Jenatzy now took the lead and was almost 9 minutes ahead of De Knyff, who was second, though the figures were subject to allowances.

DE KNYFF FINISHES FIRST

About half past five the great crowd rose in tumult. The first finisher was sighted. Much under a mile a minute the huge blue Panhard of Rene de Knyff passed under the grand stand and the veteran was quickly accorded winner. The cup would go back to France. But the excitement was not 2 minutes old when along swept the white colors of Germany—Jenatzy second. Quick mental arithmetic deducted the starting time differences and showed Jenatzy to be 12 minutes faster in gross time and winner of the race and cup.

EDITOR'S NOTE.—A complete and exhaustive account of the race by a special correspondent and fully illustrated with reproductions of photographs, will be published in a subsequent issue of Motor Age.

GREATEST EVENT IN IRELAND SINCE SNAKES LEFT

Dublin, Ireland, June 30—"Arrah, now, I'd be givin' me best pig to have a seat up there with thim high-flyers," said an undersized Irishman with a shock of red hair and a vacancy in the southern exposure of his trousers, as he watched the workmen putting the finishing touches on the grand stand being erected by the Automobile Club of Great Britain. "It's too stape for me, though, and ye nadent look for me there durin' the race. Me and the ould woman will be further down the road with the childer, but we'll see the race just the same."

To "see the race" is the universal desire of every Irish man, woman and child—and pig, too for that matter, but these last are safely cooped up in the house until the race is over. The pigs can't read the signs along the course and they might get run over.

Everybody quit work early in the week and the populace has been swarming about the headquarters of the contestants like flies on a sugar barrel. The lowliest Irish lad can now talk fluently, if not scientifically, about the various cars, and those who are fortunate enough to have an extra shilling or two, have placed them on their favorites. Each contestant, regardless of nationality, has supporters among the natives, and no excessive loyalty to the English racers is shown. The Americans have been on the ground long enough to get acquainted and they have a generous following.

"Wan of thim Yankee chaps will be drinkin' out of the cup this time next wake. The Yankees are regular divils and I'm goin' to risk a bit of money on the wan what's got the same name as his car."

"Yis, but have yees seen thim Frinch machines. I'm a-thinkin' the frog eaters will have somethin' to say in this race."

"Hooray for the Dootch. The man with the name like a sneeze will win in a walk. Didn't I drame it last night? Put yer shillin's on him, me byes."

"Where's yer lyalty? Don't ye want the Englishmen to win? Then we'll get the race agin next year."

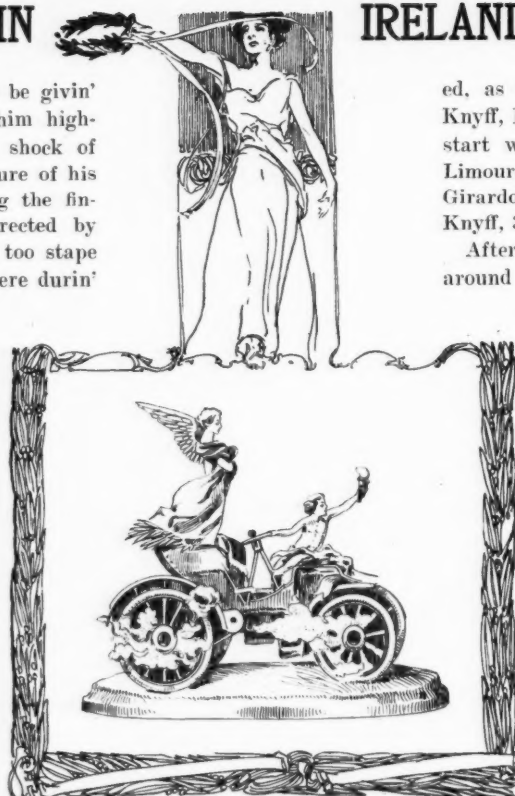
"Yis, but there ain't no Irishman drivin' any car or we'd go out and push him if necessary."

Comments similar to these may be heard on all sides, intermingled with learned discussions on the mechanical features of the cars. The native is in his glory, and he is deliriously happy. If the entire year could be made a continuous automobile race his "cup" would be full of joy and equal in value to the Gordon Bennett cup. This has been the greatest event that has happened in Ireland since the snakes were banished, and it is being celebrated accordingly.

HISTORY OF THE CUP RACE

International team racing under present conditions owes its origin to the gift of a cup in 1900 by James Gordon Bennett as a prize for such contests. By the deed of gift the Automobile Club of France was made the trustee of the trophy.

The conditions of the race call for a contest open to teams of three each from recognized national clubs. Under this category the clubs of Great Britain, France, Germany, Switzerland, Austria, Turin, Belgium and America come. A club may start one, two or three members on its team. The maker of the fastest time is the winner of the cup for the club



MOTOR AGE

The Gordon Bennett Cup

he represents, and he must be a member of that club to entitle him to drive a machine.

The victorious club has the right to name the course, which must be a suitable one in the judgment of the trustee, and must not be shorter 350 kilometers (341.55 miles) nor longer than 650 kilometers (403.65 miles). The race may be run in laps or in day's stages of not less than 94 miles each.

The competing cars are limited in weight from 500 kilograms (881.84 pounds) to 1,000 kilograms (2,204.60 pounds).

The participation of America in this year's race is due entirely to Alexander Winton, a competitor in the first contest, who volunteered to build and drive a Winton car. The A. C. A. promptly accepted his offer, named him as a member of the team, and threw open the tests to other entries.

Percy Owen, New York (Winton); Louis P. Mooers, Cleveland (Peerless); H. S. Harkness, New York (Harkness), and C. W. Matheson, Grand Rapids (Matheson), made deposits of \$600 to qualify for the elimination trials. These were run in April near Garden City, Long Island. Owens and Mooers alone presented themselves for tests and after a few unsatisfactory trials of their racing cars, which were really incomplete and untried, through the short time allowed for building and trying them out, were chosen as Mr. Winton's mates.

Messrs. Winton and Owen have been on the course for over 3 weeks and Mr. Mooers for about 10 days.

THE FIRST CONTEST

There have been three contests for the cup. Two of them were won by the French team and one by the British club, which as the present holder of the trophy named the Irish course for the contest.

The 1900 race was run between Paris and Lyons, a distance of 566 kilometers (351 miles). There were three countries represent-

ed, as follows: France by Charron, Girardot and de Knyff, Belgium by Jenatzy; and America by Winton. The start was made at 3:14 a. m. The racers reached Limours (18.6 miles) in the following order and time: Girardot, 35 minutes 15 seconds; Charron, 38:00; de Knyff, 39:30; Winton, 45:00; Jenatzy, 1:15:00.

After leaving Limours Winton's machine skidded around a corner and dashed into an embankment, partially wrecking it. Still he pushed on and at Chatendon (78.8 miles) he went by at 6:28:50, with a bent wheel in front and a rear tire punctured. Charron reached this point at 5:40:55, Girardot at 5:41:44, and Jenatzy at 5:51:56, the leader having ridden the distance in 2 hours 26 minutes 55 seconds.

At Les Ormes (95.6 miles, the order of arrival was: Girardot, 5:49:00; Charron, 5:55:00; de Knyff, 6:41:00; Jenatzy, 6:46:00.

Winton continued on to Orleans, where he arrived at half-past 8 o'clock, and then quit the race.

Girardot reached Orleans in 5 hours 53 minutes; Charron in 6:10; de Knyff in 6:49, and Jenatzy in 6h. 52m. Charron's rear axle was bent in crossing a gutter. The fourth speed of de Knyff's car had been broken at Chartres. Jenatzy had several punctures and two broken fuses.

Just after leaving Orleans Girardot broke a rear wheel against a curbstone in trying to avoid a frightened horse. He was delayed at a blacksmith's for repair until 7:55 a. m.

Rene de Knyff abandoned the race at Gien at 11:25. Jenatzy burst his tire at Chevreuse and retired.

From Gien on it was a runaway for Charron, who had secured a big lead, while Girardot was delayed for repairs to his wheel. Charron ran over a dog at Moulins and over another dog 7 miles from the finish.

Charron's time was 9:09:49 and Girardot's 10:30:28. The winner rode a Panhard. His average speed per hour was 39.09 miles. Charron had won the Paris-Bordeaux of the previous year and the Paris-Amsterdam in 1897.

"Mr. Winton's machine," explained Charles B. Shanks, who accompanied the American, "developed 23 horsepower. It weighed 1,450 pounds. It had too much power and was too light to successfully compete with the high speed French machines." An amusing statement in view of present powerful, light cars.

THE SECOND RACE

The 1901 contest was run in conjunction with the Paris-Bordeaux race. It was a walk-over for the French team composed of Charron (Panhard), Girardot (Panhard) and LeVegh (Mors). The latter had ridden unofficially in the race of the previous year and made a good showing as far as Orleans. A German had entered but withdrew, and S. F. Edge, an Englishman, was not permitted to ride because he had replaced a punctured British tire with a French one.

Charron and LeVegh collided and left Girardot to finish alone. The winner covered 327½ miles in 8 hours 50 minutes 30 seconds, a rate of 37.02 miles an hour. Girardot finished eighth in the open race of 348 miles, which was won by Fournier in 8:44:14. Fournier covered 330 miles outside of towns in 6:11:44, an average of over 53 miles an hour.

Last year's race was run in connection with the Paris-Vienna contest. It was run in two stages, Paris to Belfont, and Bregenz to Innsbroeck, a total of 379 miles. A neutralized control of one day through Switzerland intervened. French and English teams alone competed. S. F. Edge, C. S. Edge, C. S. Rolls and Charles Jarrott, driving Napiers, represented England, and de Knyff (Panhard), Fournier

(Mors) and Girardot (C. G. V.) France.

In the first day's run Rolls ran into a railway gate, and Fournier, while leading, burst a tire near Chaumont. Both were put out of the race. Girardot also broke down and went out the first day.

The second day, which ended the race so far as the cup was concerned, the contest narrowed down to de Knyff and Edge. Twenty-

five miles from the finish the Frenchman broke down. Edge finished the 389 miles in 10 hours 42 minutes, having covered the last stage of the journey (132.5 miles) in 4 hours 38 minutes.

It was a rough road to travel, yet the Englishman averaged 36 miles an hour for the whole distance, which was fairly good time considering the difficulties.

THE CARS IN THE GORDON BENNETT RACE

Of the American team Louis P. Mooers drives a Peerless, Alexander Winton a Winton and Percy Owen a Winton.

The new Peerless racer is driven by a four-cylinder vertical motor of 80 horsepower. The cylinders are of 6-inch bore and stroke, made of steel 5-16 inch thick, with cast iron water jackets and combustion chambers. The admission and exhaust valves are mechanically operated. Two systems of ignition are employed; one a jump spark placed directly over the inlet valve, the other a contact spark alongside the inlet valve.

The car is equipped with sliding gear transmission and ball bearings are used throughout the machine wherever possible. The motor, including the fly wheel, weighs about 700 pounds, and the car complete about 2,000 pounds. The governor is in front, driven from the two-to-one gearing of the motor, and the water circulating pump is in the rear of the motor. The oiling is by a force feed mechanically operated lubricator, chain driven from the cam shaft.

The wheel base is 9 feet 4 inches, the tread is 4 feet 8 inches, and the wheels are fitted with 4½-inch Goodrich clincher tires. The length of the car over all is 13 feet 4 inches. The water tank capacity is 8 gallons, and the gasoline capacity 40 gallons. The radiator is made up of copper

tubes ½ of an inch in diameter. The frame, which is of channel section, is carried on four semi-elliptic springs, 3 feet long in the front and four feet long in the rear.

THE TWO WINTON CARS

The new Winton Bullet has eight cylinders placed horizontally across the center of the frame of the car, and arranged in two sets of four each. The cylinders are of 5-inch bore and 6-inch stroke. The cylinder heads project beyond the side of the car and are so arranged that any of them may be removed for inspection by simply loosening two nuts. The cylinders are of cast iron with aluminum water jackets. The water tank is set above the forward set of cylinders. The eight pistons drive a divided crank shaft, which is coupled in the center. Only one fly wheel is used, which weighs but 75 pounds.

The carburetor is of the standard Winton touring car pattern. The motor has a minimum speed of 100 and a maximum of 1,000 revolutions per minute. The spark mechanism is located above and between the two sets of cylinders and is controlled by means of a small lever at the seat.

Two centrifugal pumps are used in the circulating system, one for each set of cylinders. The radiating coils are much larger and more numerous than in a standard car. The braking system consists of three sets, being in reality five brakes. A pedal actuates the fly wheel brake and the internal hub brakes, while the high speed lever disengages the clutch and applies the external hub brakes. The exhaust is through a single pipe to the rear of the machine, no muffle being used. The entire mechanism is hung from the running gear, which consists of a wooden frame reinforced with steel plates.

The wheels are 32

inches in diameter with 4-inch Goodrich tires. The wheel base of the car is about 9 feet 6 inches and the tread 4 feet 8 inches. The car with tanks empty weighs 2,150 pounds. The gasoline capacity is 22 gallons and the water capacity is 12 gallons.

Percy Owen's Winton is similar in many respects to the new Bullet, except that it has only four cylinders and weighs only 1,450



The Starting Point at Ballyshannon



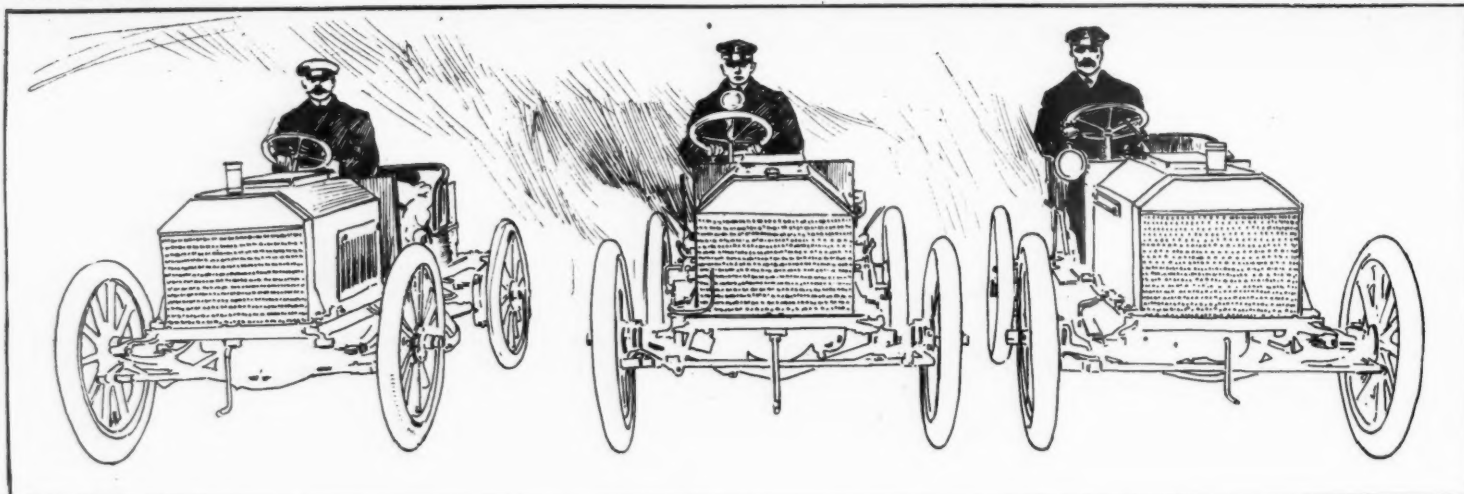
Erecting the Club Stand at Ballyshannon



Rheban Castle, Athy, Headquarters of English Team

THE ENGLISH TEAM

MOTOR AGE



Edge—Napier Car

Jarrott—Napier Car

Stocks—Napier Car

pounds with the gasoline and water tanks empty.

There are no cross braces on the frame, the side bars being connected and held together by the radiator, motor, gear box and rear axle. Only one carburetor is used, which is located upon the left side of the machine and with a small hand wheel adjustment within easy reach of the operator. The ignition system consists of a single induction coil and storage battery. The spark plugs project into a narrow aluminum box on the left side of the car. The fly wheel weighs 125 pounds and the motor is rated at 40 horsepower.

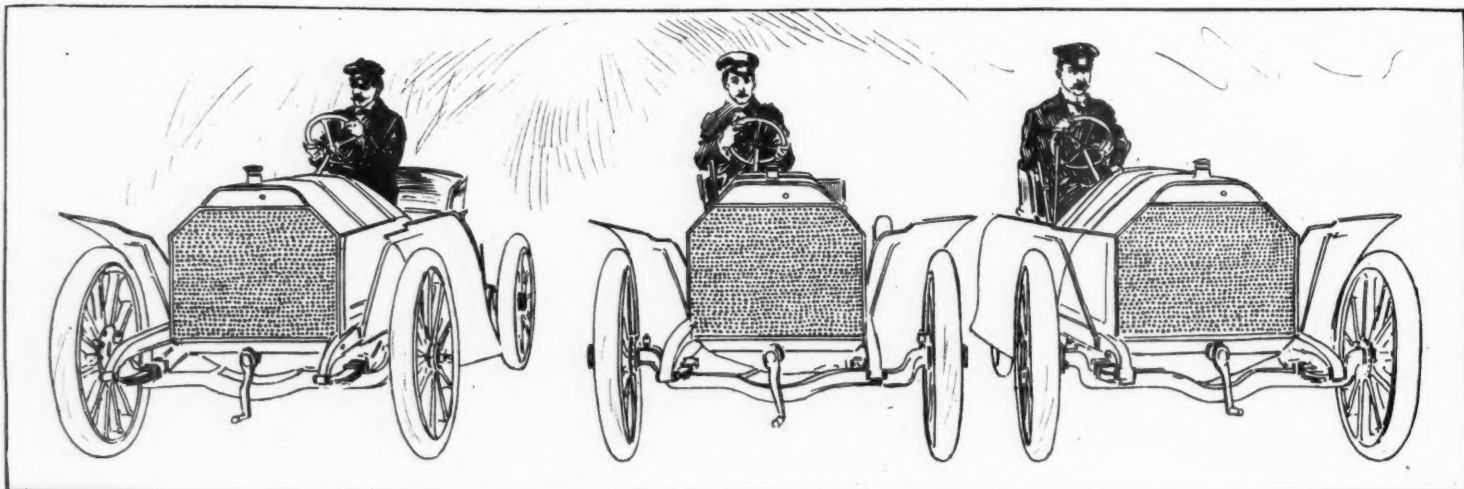
The wheels are 32 inches in diameter, with 4-inch Goodrich tires. The front axle is dropped and the springs mounted on top, while the rear springs are hung below the axle. The frame is of wood with $\frac{1}{4}$ -inch steel sheathing.

The brakes are two sets, acting on the interior and exterior of the brake drums on the driving wheels. The motor is hung horizontally across the front platform, with the cylinder heads on the left side. The car has two speeds forward and reverse, with a propeller shaft connected with a bevel gear drive on the rear axle. On the high speed the drive is direct. The wheel base is 8 feet 6 inches.

THE MERCEDES CARS

On account of the unfortunate burning of the Daimler factory at Cannstadt, Germany, the members of the German team, Foxhall Keene, Baron de Caters and Jenatzy, are compelled to drive 60-horsepower Mercedes cars instead of 90-horsepower machines as originally intended.

THE GERMAN TEAM



Jenatzy—Mercedes Car

Foxhall Keene—Mercedes Car

Baron de Caters—Mercedes Car

While naturally not so fast as the bigger pattern, the 60-horsepower cars are well in the running. They are the same as those used in the events during the week of Nice.

The four-cylinder motor of the Mercedes-Simplex 60-horsepower car merits some consideration. The inlet valves, which are of extraordinary design, are fitted directly into the top of the cylinder heads. The inlet valves have three separate and distinct seats and the area of the combined opening would be equal to a valve of 8-inch diameter with a single seat. The cylinders have a bore of 5.46 inches and a stroke of 5.85 inches.

The radiator is of the well known honey-comb type, the tubes having longitudinal corrugations. The water is circulated by a powerful centrifugal pump operated from the magneto shaft. The mechanism which controls the change speed gear is operated by a cam in the gear case, so arranged that it may be rotated by a simple backward and forward movement of the controlling lever. The forks which move the sliding gears are extended to carry rollers engaging with grooves in the faces of the cam plate, so that the various gears may be thrown in and out of mesh without the possibility of two sets of gears coming into mesh at the same time. To facilitate changing the sprockets, the ends of the countershaft are fitted with flanged hubs, to which the sprockets are attached by six bolts.

The axles are of I beam section, which gives unusual strength in proportion to the weight. The steering centers of the front axle are on

the line of the wheel tread and the jaw of the steering knuckle is on the wheel spindle and the eye on the axle itself.

The new method of hand regulation by which the simple movement of one of the levers above the steering wheel regulates the lift of the inlet valves enables the operator to control the motor very effectively.

THE NAPIER CARS

All three of the British team, Jarrott, Edge and Stocks, drive Napiers.

The Napier 100-horsepower cars have the propeller shaft system of propulsion instead of the side chain drive of the continental cars. The bonnet measures 4 feet 2 inches from the dash to the back of the radiator. The wheel base is a trifle over 9 feet and the tread 4 feet 7 inches. The speed transmission gives three speed changes, the high gear with the motor running at 1,200 revolutions per minute giving a speed of 85 miles per hour.

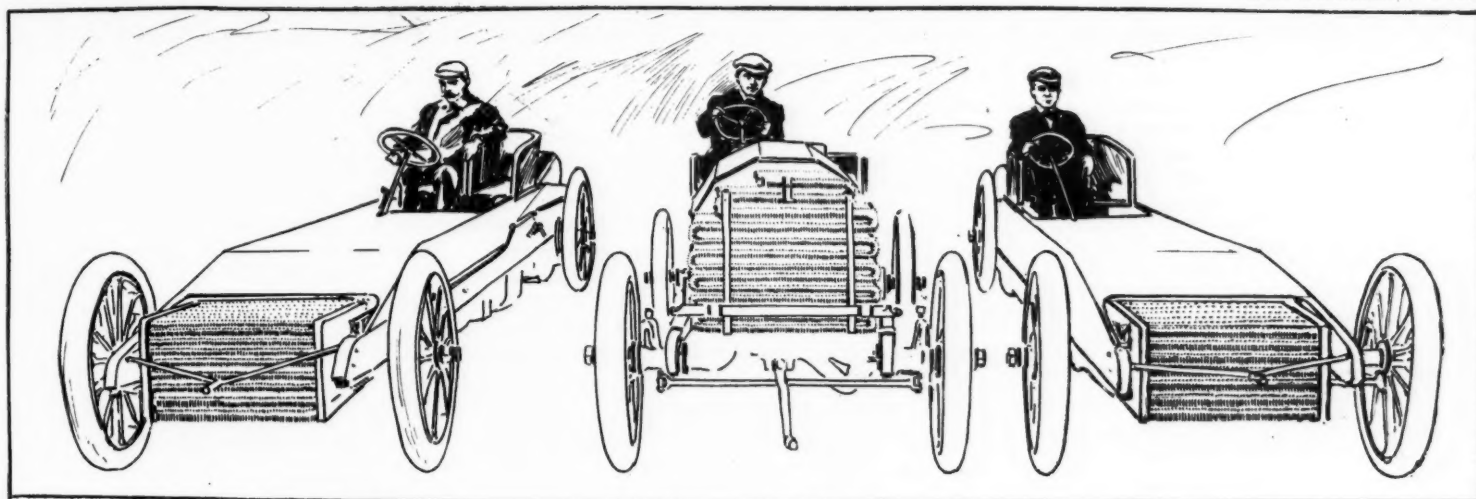
The motor has four cylinders with the usual Napier triple opening inlet valves. The radiator is formed of Clarkson's radiating coils, with top and bottom water tanks. The friction clutch is of new design and carries three thrust springs so disposed that there is no end thrust on the motor shaft. A double muffler is provided. The universal joints of the propeller shaft are enclosed in dust and oil-tight aluminum cases.

The driver's seat is set upon the gasoline tank, which has a capacity of 40 gallons. The rear ends of the front springs and both ends of the rear springs slide in slots in specially

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MOTOR AGE

THE AMERICAN TEAM



Winton—Winton Car

Mooers—Peerless Car

Owen—Winton Car

made brackets attached to the frame. The wheels are equipped with 34 3½-inch Dunlop tires.

THE MORS CAR

The 90-horsepower Mors is the most peculiar in appearance of all of the cars in the race, being the only one equipped with the continental style of inverted boat-shape body, which was introduced first on the Serpollet steam racer. But with the body off, the Mors shows itself to be cut down to the limit in the weight handling of the detail. In fact, it seems to be extremely well proportioned so far as the placing of metal for effectiveness is concerned.

The four cylinders of the vertical motor are separate and bored out of steel. The heads are of cast metal with the combustion chambers on the side. The upper and lower joints, where the cylinders join the heads and crank case respectively, are packed with copper. The inlet as well as the exhaust valves are mechanically operated, but there is a decided change in the construction from that employed in the regular models of the Mors. In the latter the inlet valves were on one side and the exhaust valves on the opposite side of the cylinders, each set being operated by a cam shaft set of its own. In the 90-horsepower pattern the inlet valve is on top of the combustion chamber of each cylinder and is actuated by a tappet which is, in turn, actuated by the mechanism of the cam shaft that actuates the exhaust valve directly through the ordinary parts.

The system of ignition includes a magneto.

The springs which support the steel running gear frame are connected by cross braces to afford greater lateral rigidity than is usual in cars of the style, and the springs themselves are usually long and strong. The steering gear and the whole front axle group are also extraordinarily strong. Pneumatic spring checks or cushions are placed between the frame and the front springs. The car is provided

THE PANHARD CARS

Of the French team Rene de Knyff and Henri Farman drive Panhards, while Fernand Gabriel drives a Mors.

The 85-horsepower Panhard is a remarkable looking machine, being for the most part motor bonnet. The motor, the bore and stroke of which are unknown, is set with a forward rake and slung by means of eye lugs to transverse rods across the frame. The water jackets around the body of the cylinders are made of corrugated gun metal sleeves, the cylinder heads and valve chambers having separate water jackets. The fly wheel clutch is of the expanding ring type instead of the usual cone friction style.

The frame is of pressed steel. The front wheels are 34 inches in diameter, with 3½-inch tires, and the rear wheels are 36 inches in diameter with 4½-inch tires.

THE WINTON CAMP IN IRELAND

Cleveland, O., June 29—Clarence Brockway, who is in charge of the Winton garage during the absence of Charles B. Shanks, who is in

Ireland with the cup team, has received the following letter from Mr. Shanks:

Ballytore, Ireland, June 17—American headquarters in Ireland have been established. The stars and stripes are floating in the breeze above the historical fortifications at Timolin Vicarage, near the village of Timolin, in county Kildare, where the Winton party has, so to speak, gone into camp.

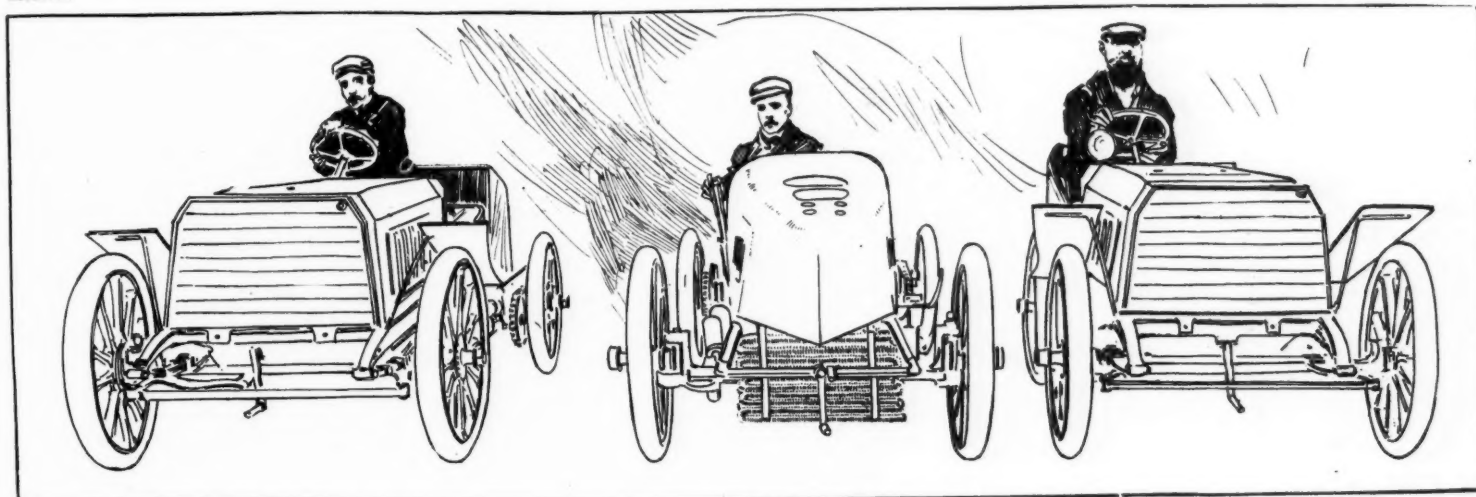
As you know, Mr. Winton arrived here a week ahead of me, and since Dublin is 25 miles distant from the Gordon Bennett course he arranged for a country house nearer the course. The vicar of Timolin turned his place over and departed with his family for a vacation in England. Two hundred yards from the vicarage is a high piece of ground, from which one may view the country for miles around. On a clear day, with field glasses, one can look into no less than a half dozen counties. * * *

On Friday afternoon the three members of the English racing team presented themselves at the vicarage. The captain of the trio is S. F. Edge, who won the Gordon Bennett trophy for the English club last year. They are an agreeable set of fellows, these English racing men, and all of them are past masters at the game of automobile road racing. Mr. Winton took them into the court where our racing and touring cars were standing and explained the details of Winton construction. The structural feature which most impressed our guests was the extreme simplicity. * * *

During the past few days Messrs. Winton and Owen have been spending a great deal of their time on the course. * * * The principal work, that of learning the course, has been accomplished with the touring cars, but from now on the racing cars will be used daily in practice over the entire course. The racing machines are behaving splendidly, and Mr. Winton is more and more of the opinion that he has hit upon the proper type of construction for such service.—C. B. SHANKS.

MOTOR AGE

THE FRENCH TEAM



Farman—Panhard

Gabriel—Mors

Rene de Knyff—Panhard

MOTOR AGE

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EUROPEAN STYLE

Despite the prophecies of those who have been tied down by prejudice to certain styles of automobile construction, each successive automobile show has demonstrated a common tendency toward what is commonly, if not exactly, termed French construction.

That this tendency has been no passing fad is even now better demonstrated by the introduction of small cars—runabouts, if you please—which are but diminutive touring cars of the style in which a vertical motor is placed under a bonnet on the front end of the running gear.

Rectangular, reachless frame, wood wheels, wheel steering, divided seat, sliding gear transmission and even propeller shaft drive—the salient features of larger cars—have come in the attempt to supplant the shaftless carriage type of runabout with a car which is more nearly like the car that the people, the lookers-on who view the industry from afar off, recognize as typical of the real automobile.

It is not the intention of MOTOR AGE to enter into a discussion concerning the relative mechanical advantages and disadvantages of different methods of construction and different systems of design.

MOTOR AGE simply points to the introduction of the small American cars of European style as evidence prima facie of a notable division of light car construction into two radically different classes, if not the substitution of one class for the other.

THE RENTING OF CARS

Rapid as its growth has been in the other phases of its development, the automobile industry has not progressed far in the renting line. Yet there is evidence in most large cities that automobile renting might be conducted profitably.

Probably the reason why so little real renting has been done is that the cash sales of automobiles have been so satisfactory that dealers have not been disposed to take chances of getting their money back slowly, even though at more eventual profit.

In fact, there is little reason why a dealer should voluntarily choose to tie up money in automobiles for renting when he can get the actual cash of their face value.

But another class of tradesmen entirely has the opportunity to enter the field. This is represented by the man who buys automobiles outright for the purpose of renting them.

He is not tied down to an agency or to any one make of car or to customers whom he wishes to please with deliveries. He is simply

independent of the whole trade. He can conduct an establishment which will handle no other work than the renting of cars and the repair and maintenance of the cars which are rented.

It is likely that this can be done profitably. But such a business must be well capitalized. It cannot be successfully carried on with a few cars or with cars all of the same style.

A number of cars of each of the different prevailing patterns must be kept on hand all the time. This means the tying-up of considerable capital.

The cars must be good ones, or the maintenance cost will be so heavy that it will rob the business of profit.

The next important consideration is that of competent drivers. It is hardly likely that at this stage of the industry, when the non-owners of automobiles know so little about them, there would be profit in renting automobiles without drivers.

Hence a competent driver, of gentlemanly as well as mechanical qualifications, must accompany each car that is rented.

Nor is it to be supposed that the renting public would oppose this system. In fact, many persons who contemplate the actual purchase of automobiles might be glad of the chance to drive around with a clever operator and thus not only secure the renting value of the automobile but obtain many practical lessons in automobile handling as well.

The repair shop must be an important feature and must work on the basis of prevention in preference to that of cure. In other words, each automobile must be carefully inspected when it comes in from a trip and kept always in the best of shape.

Accidents on the road are not as liable to make the expense of maintaining renting cars heavy, as is the careless and slipshod handling of the cars in the garage.

The final caution for those who would avoid failure in venturing into the renting business is that against price slashing. Good rates can be charged and they must be maintained.

DESIRABLE MATCH RACES

With the probable abandonment of the much discussed Winton-Fournier match races, there are no nationally or internationally important match races scheduled for this summer.

It is highly probable, however, that there will be several notable matches at the various big track meetings, for the match race is one of the surest races for drawing a crowd and pleasing a crowd after it is at the track side.

The match race is generally a race absolute, with little chance of bad luck conditions "knocking out" the star performer.

Two men only on the track and all interest centered in them, the conditions both for racing and enjoying the race are first-class.

In the way of national match races, there are many chances of good and closely competed events. For instance, Winton with the new Bullet against Barney Oldfield would excite wide attention and undoubtedly prove a great race; or Winton against Mooers.

The Mathewson machines are being completed at Grand Rapids, Mich., and one of these might be matched against either Winton, Mooers or Oldfield's cars. Percy Owen's Winton also comes in this class of racing cars and he might race with it against Winton, Mooers, Oldfield or Mathewson.

Then, the specially built racer of H. S. Harkness may prove fast and reliable and worthy of a match with any of the above. A match be-

tween Oldfield and Cooper is not essentially a drawing card, for the machines are substantially alike, with Oldfield almost the sure winner.

Of international importance would be match races between Winton, Oldfield, Mooers, Owen, Harkness, or Mathewson, and Foxhall Keene, or any other of the wealthy New Yorkers who will likely bring big European racing cars to this country during the summer.

Then, if some of the favorites of the other side could be induced to come here for track racing, we have the same big cars to compete against those of Fournier, Jarrott and Gabriel, the trio which would probably draw the biggest crowds.

Looking at the matter from a general point of view, there is much material this summer for excellent, hard fought matches. It is up to the clubs and other race meet promoters to bring the racers together.

CARS FOR DIFFERENT USES

Even some in the trade put too close a limit upon automobiling. They are prone to make of automobiling a pleasure or a sport or a pastime or something which is strictly a class. They talk of motor cars of all varieties as automobiles.

This is evident from conversations in which the idea is presented that users of automobiles switch from one pattern of car to another.

All such changes represent the conditions of a formative period. There will be a time when an automobilist will not be an automobilist any more than a bicyclist is now a bicyclist.

The bicycle is common to all. So is the horse and buggy and so will be the automobilist.

Then there can be no distinct preference of one pattern over another any more than there is a distinct preference among "buggists" for cabriolets over runabouts.

When a machine becomes a recognized medium of travel, it is produced in a variety of forms to accommodate the varied uses to which different persons will put it, or to which the same persons will put it under different conditions.

There can be no lasting talk of this pattern or that pattern. Styles may change. There may be a general shifting in the methods of construction but there will always be cars of radically different patterns serving radically different purposes.

Motor carriages will be known by the special names which characterize their patterns—not by the generic term automobile.

THE TRACK MILE

Although the official world's record for the mile straightaway is 46 seconds, while the world's record for the track mile is 59½ seconds, the establishment of the latter record in reality represents the more remarkable performance.

Despite the difference of 13½ seconds in time, the driving of an 1800 or 2000-pound car at such speed around an oval track all but flat is naturally more difficult than guiding a car over a straightaway course of equal surface condition.

The breaking of the mile straightaway record represents a new mark in the building of fast cars. The breaking of the track record represents not only progress in automobile construction but also in the individual skill of operators.

There is more occasion for skill, and a bet-

ter chance of repeated reductions of the time, by the same driver and machine.

So while France is peer in short distance speed trials of an absolute or unrestricted nature, America, in holding the track record, really possesses that to which the greater credit in the sport is attached.

The straightaway record reflects more upon the progress of the automobile industry than upon that of the automobile sport.

But the breaking of the track mile, now that it is under 1 minute, represents not merely an exceedingly difficult feat. It represents as well a dangerous feat.

The tracks upon which this record is broken occasionally were not built for a speed under 1 minute per mile. They were made for speed nearer 2 minutes than 1 per mile.

Not until special automobile tracks capable of standing any speed are built will the breaking of the mile track record become on a par with the breaking of the straightaway record.

The Car, of London, England, suggests that in the future the streets be relaid with a con-

cave surface with a slight slope from the edge of the pavement toward the center of the roadway. Heavy vehicles would then naturally have to keep to the higher side, and in wet or dusty weather refuse and slush would drift away from the pavement and not towards it. the drains being in the center. As at present constructed, the water and mud on a rainy day collect on the edge of the pavement and are splashed on the pedestrian.

Henri Fournier says it is not advisable to allow women in the front seat of an automobile. The fair passenger is likely to distract the attention of the driver, who, in permitting his thoughts to wander from the steering wheel, may possibly allow his hands to do likewise, and accidents will be more likely to occur.

The chauffeurs of Paris have boycotted Saint Germain. This is a municipality about 8 miles from Paris and it is situated on one of the favorite roads leading to the north and northwest districts of France. Gendarmes and po-

licemen have been stationed at the corners of the main streets in order to fine all the drivers of motor cars who go at a speed greater than 6 miles an hour. L'Auto publishes daily a warning to chauffeurs to avoid Saint Germain, and also gives directions regarding roads that will lead around it.

The Dayton, Ohio, Automobile Club makes a feature of chicken dinners on its weekly club runs. As the members never run over chickens along the roads, it is presumed that the fowls are purchased and killed in the ordinary way and not gathered in along the route.

An objection made to placing numbers on automobile lamps is that the numbers project shadows on the road, and these look like obstructions, making it difficult for the driver to distinguish the real dangers of the road.

The Gordon Bennett cup is insured for \$2,500, which goes to show that the cup is worth something with sentiment left out of the consideration.

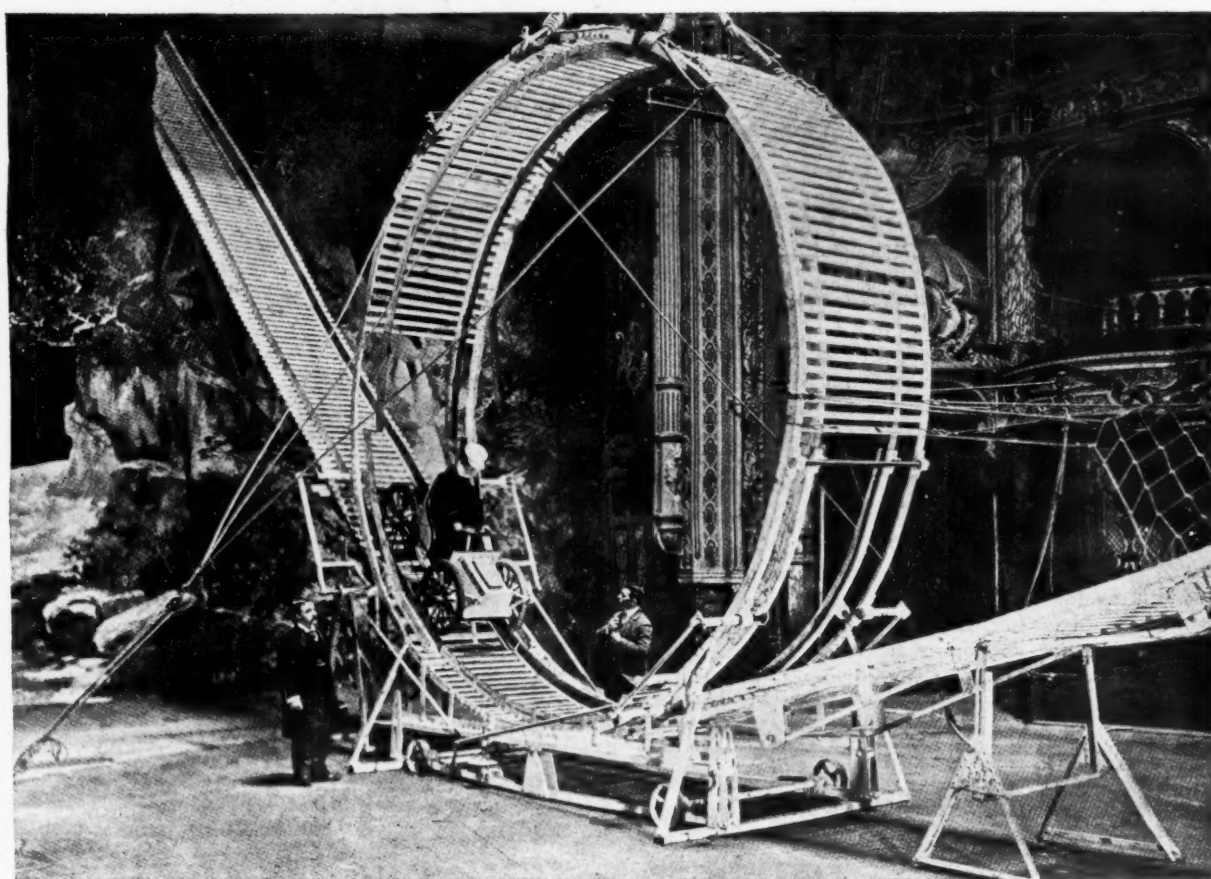
AUTOMOBILING AROUND A LOOP IN LONDON

The American spectacle of little Indians trundling their war whoops around is now being outdone by Miss Mia Alix, a 17-year-old German beauty, in her act of "hooping the hoop" in a motor car at the London, England, hippodrome. As may be readily imagined this is British for "looping the loop."

In this spectacular feat the start is made

from a height of 60 feet on an approach track 4 feet broad set at an angle of 45 degrees. The top is behind the stage so that the audience cannot see the start. Close to the spot where the car is placed in the illustration stands the man who regulates the width of the latter part of the track and closes the entrance after the car enters the loop. The car is fitted with

pneumatic tires and runs in grooves. No motor is used. The official time of the flight of the car around the loop is $2\frac{1}{2}$ seconds, making the average speed 300 miles an hour. The young lady is not strapped to the car but grasps the steering wheel with both hands. A heavy net is placed at the finishing point to break the shock of the stop.



Miss Mia Alix Looping the Loop in the London Hippodrome

SMALL PARTY TAKES THE LONG RUN

**Backsliding Reduces Ranks of Company
Bound From Chicago to Mammoth Cave
—Trip too Long for Business Men**

In point of numbers the start of the Chicago Automobile Club on the Mammoth Cave trip last Thursday did not come up to expectations, but what was lacking in this respect was made up in the enthusiasm of those who did start. The club membership consists principally of business men who cannot conveniently be away from their desks for the length of time consumed by this trip, and for this reason a great many had to forego the pleasure of the run. Even at the last moment, almost, some were compelled to give up the expedition, after having made all arrangements to go. President Charles W. Gray has purchased a new Peerless car to take on this trip, but urgent business caused him to abandon the journey the day before the start. He joined the party at Indianapolis Sunday.

Eight motor cars left the club house for the initial day's run on the longest trip ever attempted by the club, the entire distance to the caves and return being about 1,000 miles. The schedule for the first day was to run to Cedar Lake, Ind., about 50 miles, where a reception and ball were given. The starters were W. P. Smith, Toledo; Chas. E. Bartley, Toledo; W. G. Lloyd, Peerless; J. B. Burdette, Darracq; P. J. Hyman, Autocar; Geo. E. Gray, Cadillac; A. S. Ormsby, Winton; W. H. Robinson, Friedman. All these cars were filled, making a total of thirty ladies and gentlemen to depart from Chicago.

The start was made at 11 a. m. and Hammond, Ind., was reached shortly before 1 p. m. After lunch the party continued the journey, reaching Cedar Point hotel at 6 p. m. The roads all the way are macadamized, the weather was fine, troubles were few and the trip was an ideal one. A punctured tire on Smith's car and a broken bolt on the Friedman were the only accidents of the day. Chas. E. Bartley caused some surprise by developing a slight case of "motor madness," outdistancing the others and arriving at the hotel considerably in advance of the crowd.

FUN AT CEDAR LAKE

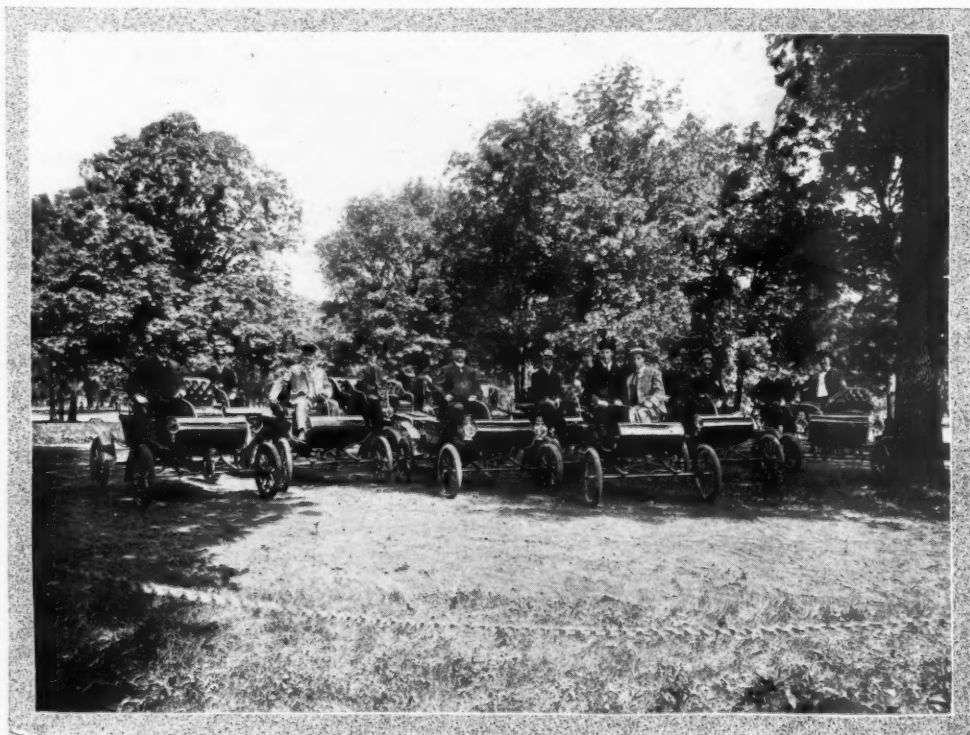
The arrangements made by Chairman F. H. Davis and Assistant Secretary De Friest had been properly attended to so that abundant entertainment was provided. A steam launch took the party on the lake, the orchestra furnishing the music for a moonlight dance on the deck. Later in the evening the ball room at the hotel was thrown open and the dancing continued until after midnight.

Carl Fisher and E. O. Langden, of Indianapolis, were at the hotel to receive the party and act as guide to Lafayette, the end of the second day's trip.

The party which left for Lafayette, with the intention of making the entire trip, consisted of Mr. and Mrs. W. R. Smith and son Earl, and J. M. Thorson, in a Toledo; Mr. and Mrs. A. S. Ormsby, Dr. F. H. Davis and John E. Fry, in a Winton; Mr. and Mrs. J. B. Burdette and Mr. and Mrs. J. E. Stevens, in a Darracq; Carl Fisher and E. O. Langden in a Winton. The remaining cars returned to Chicago Friday, reporting at the club house at 4 o'clock in the afternoon.

700 MOTORISTS IN PITTSBURG

There are now over 700 automobiles in use in Pittsburg, Pa., of which 150 have been bought this year. Physicians especially have adopted the motor vehicle, and it is estimated that fully three-fifths of the doctors in the city who formerly drove carriages, are now using motor cars. Other professional men are taking



MOTOR AGE

The Bloomington Automobile Club

up with the machines even more rapidly than the business men. The dealers are now carrying a full stock in order to facilitate prompt deliveries. During May and June one firm has averaged twenty sales a week.

The Duquesne Brewing Co. has a new delivery automobile, which carries fully one-third more than the average brewery wagon and makes much better time on the crowded down town streets.

AN ILLINOIS CLUB

The illustration shows the Bloomington, Ill., Automobile Club. The different makes of cars used by the club are the Yale, Elmore, Thomas, Locomobile and Oldsmobile. The club now has twenty-two members. Secretary Throbo left on June 24 for Norway and will spend the summer touring through Norway and Sweden.

Salt Lake City, Utah, will have an automobile club this summer. Captain Croll, of the Salt Lake City baseball club, is agitating the organization among the automobile owners of that city.

BAILEY LAW FIGHTS HAVE BEGUN

New York Associations Go into Court to Protect Tradesmen Engaged in Selling and Demonstrating Their Cars

New York, June 28—Bailey law battles have begun in the lower courts. They bid fair to be carried to the higher ones. Counsel for the National Association of Automobile Manufacturers and the Automobile Club of America are taking a hand in them and an individual owner is to fight it out on his own hook.

TRADESMEN IMMUNE

The first cases arose under the trade provision of the law exempting dealers and makers, in the pursuit of their business, from registration and, of course, from carrying license tags. The time limit for procuring these tags expired on June 14. There was a report on Thursday that Police Commissioner Greene had ordered all without them to be arrested.

Secretary Unwin, of the N. A. A. M., hurried down to see the commissioner to learn whether any police regulation had been made to supply the defect in the law, which failed to declare how exempt tradesmen were to avoid the annoyance of arrest and appearance before magistrates. General Greene was out. In view of later developments Secretary Unwin refrained from further attempt to see the commissioner and left the matter to Charles Thaddeus Terry, the N. A. A. M. counsel.

George B. Adams, New York representative of the gasoline end of the Pope Motor Car Co., was the first victim. He was arrested on Thursday

while demonstrating a new four-cylinder Toledo in Central Park. Justice Flammer discharged him after reading the law and without giving the A. C. A. counsel a chance to advance an argument.

The next day James W. White, a mechanic, employed by E. J. Willis, New York agent for the Orient Buckboard, was gathered in and taken before Justice Flammer. G. E. Miner, the A. M. L. president's partner, his counsel, contended that the law logically applied to mechanics in the employ of dealers. The judge took this view, too, and White was freed.

THE FIGHT STARTED

Yesterday, however, a justice was found who disagreed with Justice Flammer's interpretation of the law. James P. McWilliam, in the employ of F. A. La Roche, of the American Darracq Co., was brought before Magistrate Poole. The law itself and the Flammer rulings were cited to no effect. McWilliam was placed under bonds to appear before the court of general sessions.

Here the N. A. A. M. will make its fight

against this constant annoyance of those engaged in selling and demonstrating automobiles. An action for false arrest in the case of Mr. Adams is contemplated by the association.

FOR PASSING A CAB

Orrel A. Parker, of the A. C. A., is mad all the way through at being arrested on Fifth avenue when going up grade at a slow pace merely because he passed a number of cabs that had slowed down. He was promptly discharged. He did not, however, let the matter drop here, but at once directed his attorney to bring suit against the policeman for false arrest. If he wins it will be a great advantage gained, for other policemen will be warned that they cannot make unreasonable arrests with impunity. In any event Mr. Parker's example is likely to be followed by other sufferers.

MILE TRIALS IN PITTSBURG

The Steel Town Club Arranges Speed Contests Over a Roped-in Boulevard Course—Speed Limit Agitation

Pittsburg, Pa., June 30—A speed contest will be given on Beechwood boulevard July 11 by the Automobile Club of Pittsburg. In order to avoid all possibility of accidents policemen will patrol the course in automobiles during the races.

The course will be a mile long, the start being near Brilliant pumping station, running toward Frankstown avenue at a slightly ascending grade. There will be eight speed tests for different classes of vehicles and a free-for-all contest. The tests are open to club members only. The entire course will be roped in as an additional precaution against accidents.

The great opposition aroused by the automobile club against the order prohibiting automobiles in Riverview park caused the order to be rescinded, but the department will have policemen stationed along the highways to see that the speed limit regulations are not violated.

The city councilmen will be given a ride in automobiles some day this week by the lobbying committee of the automobile club for the purpose of demonstrating the weak spots in the automobile ordinance now pending. The motorists want the privilege of a greater speed than 8 miles an hour, which is prescribed in the legislation, and proposes to show the law makers that a maximum speed of 16 miles an hour would not be dangerous on the wide thoroughfares in the east end.

CANNON LOOKING FOR RECORD

George C. Cannon, the Harvard student, will within the next 2 or 3 weeks attempt to secure the mile track record for steamers. He has made arrangements with the Readville track, near Boston, for a record trial and is now securing his quota of timers and other necessary officials. He says that he can make his steamer travel the mile on that track in 57 seconds. Since Memorial day he has thoroughly overhauled his machine, and it is now in the best of condition. Mr. Cannon is also looking for the straightaway mark and as soon as he can find a suitable course he will make the attempt to secure that record.

The Locomobile is represented in Mexico City, Mexico, by Hilario Meenen.

St. Paul, Minn., has issued sixty licenses for automobiles.

POSTPONEMENT IN WASHINGTON

Case of Dealers Against District Commissioners To Prevent Enforcement of Automobile Regulations Still Hangs Fire

Washington, D. C., June 27.—Further hearing in the suit of Carl J. Lockwood, an automobile dealer, against district commissioners to prevent the promulgation of the proposed automobile regulations, has again been postponed, this time until July 2. This is the third time the hearing has been postponed on the petition of the commissioners, who have been unable to prepare their case for proper presentation to the court. The hope is generally expressed among the dealers and individual automobilists that the case will be decided one way or another during the coming week.

JURY TRIAL DENIED

A budget of opinions was handed down during the week by the court of appeals, one of them being of particular interest to automobilists. It was that of John Bowles, plaintiff in error, against the District of Columbia, in which the judgment of the police court was affirmed by the higher court. Bowles was prosecuted in the police court on the charge of violating a police regulation which prohibited the driving of automobiles on the city streets beyond a specified rate of speed. He demanded a jury trial, which was refused, and was fined \$25 or 60 days in the workhouse. He excepted to the ruling of the court and was permitted to remove the case to the court of appeals. The higher court held that "as the offense of fast riding was not made such at common law, but is only made such by municipal ordinance in this and other cases, we do not find that the constitution of the United States has anything to do with the method of its punishment."

With reference to the argument of the plaintiff that the code provides for an alternative punishment in this case by imprisonment for more than 30 days, and therefore entitled the party to a trial by jury, the court says: "The vice of this argument is so patent that it requires no great amount of consideration. If it were well founded every violation of the municipal ordinance would have to be tried by jury."

CLUB SECRETARY IN SAME FIX

As Mr. E. M. Sunderland, secretary of the National Capital Automobile Club, has a similar case pending before the court of appeals, it is presumed the court will follow the same action as in the Bowles case. Mr. Sunderland is determined, however, to persevere in his case and will undoubtedly take it to the supreme court of the United States if he is defeated.

DIFFICULTY OF CORRECT TIMING

The attempts of some amateur timekeepers to measure the speed of automobiles seems more or less ridiculous, and often proves annoying. The ideas of different people regarding the speed at which a car is going varies greatly, and while one man may say 25 miles an hour is being traveled, another will guess 10 miles, when perhaps the actual rate of speed is about 15 miles. The ordinary policeman with his ordinary watch can not get a very accurate record, and therefore not too much dependence should be placed on the figures he turns in. To be just with both parties the timing should be correctly done, and it will be found that very few men do this accurately.

In a race where fractions of seconds mean so much, it requires a quick eye and a steady nerve to get the correct time. For instance, when a car is traveling at the rate of 80 miles an hour, an error of $\frac{1}{2}$ of a second means a distance of 24 feet traveled in that time. The tension on a timekeeper is great and there must be no nervousness.

In the art of timing two things are indispensable: The watch must be correct and the timekeeper must understand his business. It is only in the last 20 years that pocket watches for taking time have been brought to a high standard of perfection. The chronograph is the only instrument capable of taking total and intermediate observations and its accuracy is not to be doubted. The Gordon Bennett race will have eighty-four chronographs in use, and these must be absolutely correct in order to get the times of the different cars.

In speaking of the methods used to insure perfection in these instruments, an English writer says that the requirements for official timekeeping are very stringent. After a watch has passed examination at the government observatory it is again inspected by experts appointed for that purpose, and no time will be accepted as taken by a watch unless it has been submitted and favorably reported upon.

SIMILAR TO THE MOTOR LEAGUE

The Motor Union Has Been Organized in England To Promote Individual Interest in Automobile Touring

For the motorists who do not care to seek membership in a social or semi-social club, but who are keenly interested in automobilism and are anxious to co-operate with others to extend the rights and privileges of automobilists, there exists in England an organization known as the Motor Union. The purpose of this body is to advance the automobile movement in the United Kingdom and to encourage and facilitate touring by means of motor cars.

The benefits to be derived from membership in the union are many. The union will consider claims of its members for financial assistance in respect to actions at law in connection with the use of motor vehicles, and it may also be consulted on general and legislative questions affecting the rights and privileges of automobilists.

Information is furnished free regarding the best routes at home and abroad and assistance is given in planning tours. A hotel system is now being organized to secure suitable accommodations of all kinds at moderate cost, and the union will soon be able to supply information regarding garage accommodations, gasoline supplies and the services of competent repairers when on a tour. The Motor Union is to automobilists what the Cyclists' Touring Club is to British cyclists.

MONTREAL TRIP ABANDONED

New York, June 30—At a meeting of the governors today the proposed reliance run of the Automobile Club of America to Montreal was formally abandoned.

The contest committee in reply to a letter of inquiry as to the truth of the report that the N. A. A. M. was to promote an endurance test had received an affirmative answer. It accordingly recommended that as in its opinion the makers ought not to be asked to support two tests, and as there was no necessity for but one, the project be abandoned. The governors thought so, too, and so acted.

SCHEDULE THREE HARD DAY'S RUNS

Promoters of Eastern Motor Bicycle Endurance Test Give Contestants Plenty To Do—The Entrants and Itinerary

Twenty-seven entries have been received for the 3 days' endurance run promoted by the New York Motor Cycle Club and the Metropole Cycling Club. Although the list closed officially last Saturday entries received in Monday morning's mail will be accepted. Included in these is expected George Hendee's bunch of Indian riders.

THE ITINERARY

The run is to start a 6 o'clock on Friday morning. Springfield—144 miles—will be the first night's control. On the fourth the run will be to Worcester and back to Hartford—130 miles—and the third day from the Connecticut capital to New York—118 miles.

The motor cyclists are scheduled to reach Springfield between 3:36 and 9:39 o'clock on Friday; Hartford between 2:40 and 8:15 o'clock on Saturday, and New York between 1:52 and 7:03 o'clock. The late limits are for the low power machines and stops for meals.

The scoring is on the basis of 365 points the first day, 335 points the second and 330 points the third, giving a total of 1,000 points. The scoring is based on time of arrival at the night controls.

Contestants will be allowed to replenish their gasoline and lubricants on the mornings of the fourth and fifth. No repairs or adjustments will be allowed to be made at the night controls, but must be made en route.

The entries received up to Saturday night are as follows:

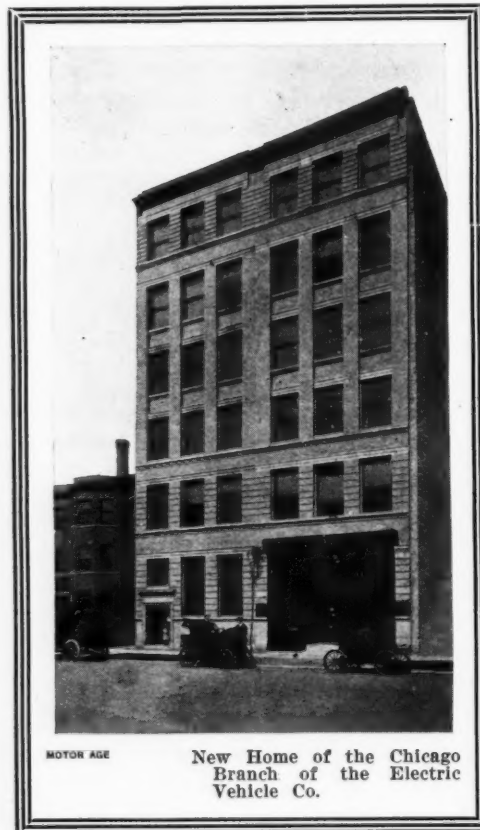
Frank Zirbes, Roscoe, Wis.	3½	Mitchell
C. S. Manowski, New York	3½	Mitchell
C. N. Emerson, Lowell, Mass.	2	Auto-Bi
J. N. White, New York	2¼	Merkel
W. E. Luettgens, So. Manchester, Conn.	3	Marsh
A. R. Marsh, Brockton, Mass.	3	Marsh
A. A. Hoyt, Whitman, Mass.	3	Marsh
W. T. Marsh, Brockton, Mass.	3	Marsh
Geo. P. Jenkins, New York	3	Marsh
J. H. Bartlett, New Britain, Conn.	2½	Marsh
Wm. D. Wahrenberger, New York	5	Hercules
G. N. Rogers, Schenectady, N. Y.	2¼	Merkel
B. F. Doherty, New Britain, Conn.	2½	Own Make
Samuel McSkimen, New York	3½	Mitchell
Geo. B. Piefer, Brooklyn, N. Y.	1¼	Indian
Frank E. Domina, Providence, R. I.	2½	Auto-Bi
Lincoln Holland, Worcester, Mass.	2½	Auto-Bi
F. Alton Clark, Union City, Conn.	2½	Auto-Bi
Chas. M. Burnham, Waltham, Mass.	3	Marsh
John E. Oest, New York	1¼	Werner
David D. Miller, New York	4	Orient
J. M. O'Malley, Hartford, Conn.	2¼	Columbia
Walter J. Ziegler, Elmwood, Conn.	2¼	Columbia
N. P. Bernard, Hartford, Conn.	2¼	Columbia
Frank A. Bowen, Utica, N. Y.	1¼	Warwick
W. A. Roberts, Clinton, Mass.	1¼	Warwick
Ellery C. Fisher, Brockton, Mass.	2½	Auto-Bi

MONEY IN RENTING CARS

There is an undeveloped field in Chicago which is now ready for the harvest, and the pioneers who are early on the ground will reap the benefits to be derived. The renting of automobiles is a business yet in its infancy,

but is one that offers exceptional money making attractions. The dealers of the city have not attempted to rent machines, as they have been busy delivering or trying to deliver the machines as fast as they were sold. The Locomobile Co. of America has done a little renting in a spasmodic way, but it frequently is sold out and has no cars to supply renting customers. Some of the other dealers have occasionally rented cars, but renting has not been taken up as a regular feature by any of them.

The wagonettes making regular trips through the parks are well patronized, but as these run over the same course day after day they do not meet the wants of the many who wish to ride as fancy dictates. There are many persons who would willingly pay \$25



for the use of a car for a day, and some of the dealers say they have been offered even more than this amount. For short trips \$3 an hour is generally charged. An automobile renting station with touring cars, runabouts and other styles of vehicles could keep the cars in service almost constantly.

TO HOLD SHOW IN MARCH

The Boston Automobile Dealers' Association has already closed its option for Symphony hall for 1 week in March next. It will then hold its second annual automobile show, arrangements for which will be started much earlier this season than a year ago. This action on the part of the association is considered indication of its holding its own exhibit, rather than joining hands in a show and exhibition with the Massachusetts Automobile Club as many believed it would do. Last year there were two shows, and inasmuch as the Massachusetts Automobile Club also retains an option on Mechanics' building, history may repeat itself.

The clumsy wagons that have long been used by the Russian government to convey the mails between the railway stations and the general post office at St. Petersburg have been replaced by fourteen automobiles.

TO BE RID OF LABOR TROUBLES

The Peerless Company May Leave Cleveland—Orders Taken for 1904 Machines—Konigslow To Make Gasoline Cars

Cleveland, O., June 30—An official of the Peerless Motor Car Co. states that the company has practically decided to move out of Cleveland, but no location has yet been settled upon. The company desires to secure a large and well arranged factory in some city not far from Cleveland. Several propositions are under consideration and it is probable that the most desirable one will be accepted in the near future. The reason for leaving Cleveland is the fact that labor troubles are constantly occurring and it seems impossible to secure a permanent supply of high-class labor. By moving to some smaller place the company believes it can secure permanent workmen who will buy their own homes if assured of steady work, and in this way a repetition of the labor troubles inflicted on Cleveland concerns this summer will be obviated. The Peerless company is not the only concern that is talking of moving away from Cleveland because of labor troubles.

SELLING 1904 CARS

Although no samples of the 1904 models have been completed, the Peerless company has already closed a number of contracts with agents as well as operators for another season's business. The sales thus far include thirty-five of the 20-horsepower cars, eleven of the 35-horsepower cars and one of the large racing machines, similar to the car used by Mooers in the Gordon-Bennett race. This machine has been ordered by Harlan W. Whipple of New York. It will not be used for racing to any great extent and will be equipped with top and touring tonneau. The 35-horsepower car is of the four-cylinder type and will be similar to the car which heretofore has been designated as the racer.

KONIGSLOW LIGHT CARS

Otto Konigslow, the well-known manufacturer who heretofore has confined his efforts principally to the manufacture of special parts for automobile manufacturers, will devote his chief efforts in the future to the manufacture of light cars of a design which has been thoroughly tested. The first lot of ten is under way.

An automobile laboratory for the study of automobile equipment will be established at Case School of Applied Science, this city, this fall. Manufacturers of automobile material will donate the equipment for this laboratory, and it is claimed it will be the only one of its kind in a college in this country. The Case laboratories in other lines are famous throughout the country, are used by manufacturers in testing their goods, and it is safe to say that much instructive data will be worked out in the tests to be made on the apparatus of Cleveland manufacturers.

CHICAGO MISREPRESENTED

Some one has been imposing on the poor old Commercial Gazette, of Pittsburg, Pa. In an alleged interview with Director of Public Works E. J. McIlvain, of that city, last week, he is made to say that automobiles are not allowed in South park, Chicago. This is given as one of the reasons why the park board of Pittsburg should forbid automobiles in River-view park. Director McIlvain is quoted as

saying that he wants to see the pleasant faced crowds in Riverview park that he witnessed in South park in Chicago. If Director McIlvain speaks from the fullness of his heart, he must have sought a secluded spot in South park, for there are at least 500 automobiles to be seen there every Sunday at this time of the year. The South park is the favorite drive-way for Chicago motorists.

THEY MAY BE BUILT IN PARIS

Daimler Plans Include a French Factory for Manufacture of Mercedes Cars—About the Cannstadt Fire

A general meeting of the members of the Daimler Co. was held shortly after the fire at Cannstadt, Germany, and it was decided to start a plant in Paris. M. Charley, the Paris manager of the company, will have charge of the branch. The ground has been selected and the building will be started in a short time.

In speaking of the fire at Cannstadt, M. Charley says it is not yet known how it started. The watchman had finished his hourly round only a few minutes before the fire was discovered, which was at 3 o'clock in the morning. About seventy finished cars were burned. The motors of the finished cars were in the testing room, which was not touched by the fire. The machinery hall, which was the principal and most expensive part of the plant, also escaped destruction. All of the 850 regular employees will receive their pay as usual until the factory is again in working order. The new factory at Unterdurckheim will be ready to start in about 3 months.

H. E. Frederickson, of Omaha, Neb., is the pioneer long distance automobile tourist in his part of the country. Recently he took a party of friends in his 16-horsepower Peerless and drove to Fremont, Neb., starting after dinner and staying in Fremont over night. By noon the following day the party completed their tour by covering 140 additional miles. Mr. Frederickson is planning a more extensive trip for some time in July. He expects to go from Omaha to Denver, Colo., in 3 days and then spend 2 weeks in the mountains of Colorado.

RECENT INCORPORATIONS

The Co-operative Automobile Association of America, Pittsburg, Pa. Capital \$5,000. Directors, W. A. Donkin, F. E. Jackson, H. C. Mufford, L. C. Letzkins and G. C. Jackson.

Motor Vehicle Co., Louisville, Ky., capital \$10,000. Incorporators: R. W. Otter, J. Kemp Goodloe, E. B. Ayers.

THE MASSACHUSETTS LAW AT LAST

The Much Buffeted Automobile Bill Is Finally Rushed Through the Legislature and Signed—Speed Limit of 15 Miles

Boston, June 29—The great and general court of Massachusetts was prorogued on Friday evening last. One of its last official acts was the enactment of the automobile bill, which was immediately signed by Governor Bates, so that the automobilists of this state are now living under new conditions. In brief, the bill provides for the registration of operators, automobiles, and motor cycles, the limitation of the speed to 10 miles an hour within fire districts and 15 miles an hour outside the same. It also provides that all machines shall be equipped with adequate brakes, a muffler, a suitable bell or horn, and a locking device, and that no machines shall be left unattended on the public streets or highways.

BILL A COMPROMISE

This bill has throughout the season been buffeted from committee to committee; from house to senate and back again, and at one time it really looked as though the entire bill would be laid on the table or referred to the next session. But the opponents of the automobile, led by what is known as the Higginson party, kept hammering away, so that the legislature was forced to take some action. The action has been taken, and it is not one which is satisfactory to the opponents of motor vehicles, and while not exactly what the automobilists desired, it is much better than they expected.

The matter of registration and licensing has been placed in the hands of the Massachusetts highway commission, which, it will be remembered, was created as the result of continued agitation on the part of the Massachusetts wheelmen some years ago. This commission has been empowered with all the authority necessary to carry on the work of registering and licensing, which by the way is to extend over a period of 12 months for each registration.

TWO MONTHS OF GRACE

The law went into effect with the enactment of the bill, excepting that the machines will not be forced to show their registration number before September 1, the interim being allowed for registration. The number will be displayed in such a manner as shall be determined by the commission, and although nothing is definitely known it is believed the commission will decide that these numbers shall be placed on

the front and rear of cars, instead of on both sides as well as the front and rear as was provided by the Higginson draft. The numbers shall be in Arabic figures, not less than 4 inches high.

NEW DEPARTMENT

To properly conduct this work the commission will undoubtedly establish a new department, as it is permitted to do under the law. This will be placed in the hands of one man, and naturally there are many applications for the position of chief of the automobile department. The most prominent on the list, however, is Representative Phinney, who has been a staunch friend of the automobilists throughout the contest. He had the indorsement and support of the automobile interests of this section, notably the Boston Automobile Dealers' Association, the Massachusetts Automobile Club and the manufacturers' committee.

ORGANIZE TO BUY ON PAYMENTS

Pittsburg Company Seeks To Inaugurate the Installment Plan of Business in the Motor Car Trade

The first indication of the sale of automobiles on the installment plan in this country comes from Pittsburg, Pa., in the form of an organization for installment purchasers. The following letter to a member of the automobile trade explains more or less fully the basis of operation of the new association:

We beg to bring to your attention the fact that we have applied to the governor of Pennsylvania for a charter for an intended corporation to be known as the Co-operative Automobile Association of America. The character and object of said corporation, or association, is to provide a fund by the subscription of its members and by payment of regular installments to enable its members to purchase automobiles on the co-operative plan.

We expect through our co-operative plan and our methods of transacting business to create a wide demand for motor vehicles of every description. We would solicit the co-operation of your company, and if you are not already represented in this city, perhaps we could enter into some mutual compact or agreement whereby your machines could be handled by our association.

We expect to carry on business throughout the entire year. We will have a representative in every large city and in the towns, and feel assured that our membership, before the expiration of a year, will be very extensive. Please quote us your best rate of discount on all machines.—THE CO-OPERATIVE AUTOMOBILE ASSOCIATION OF AMERICA, F. E. Jackson, Secretary.

The Electric Vehicle Co. branch is moving this week to its new location two doors north of its former place at 1421 Michigan boulevard.



What Was Left of \$1,000,000 Worth of Mercedes



MOTOR AGE

The Burned Mercedes Factory at Cannstadt, Germany

CHICAGO TRADE ASSOCIATION ORGANIZED

Representatives of Sixteen Automobile Houses Join for Mutual Protection and Cooperation—Board of Appraisers for Second-Hand Cars To Be Appointed—Officers Elected and Constitution and By-Laws Adopted

Aside from the fact that just a little feeling was displayed over the election of officers, the adjourned meeting of the Chicago Automobile Trade Association, held at the home of the Chicago Automobile Club, on Wednesday evening of last week was a complete success. The roll call showed that there were present representatives of sixteen local houses. The committee, appointed at the first meeting to draft a constitution and by-laws, reported that the constitution of the New York association had been accepted as a basis, but that a number of minor changes had been made. The following was adopted after a brief discussion:

ARTICLE I—NAME

This association shall be known as the Chicago Automobile Trade Association.

ARTICLE II—OBJECT

Section 1—The object of the association shall be to promote harmonious trade relations and to afford protection to its members and to the public.

ARTICLE III—POWER

Section 1—The association shall have power to make by-laws for its government and to amend and alter the same, and such by-laws may provide for the collection of necessary dues and the creation of proper offices, such as president, vice-presidents, secretary and treasurer and such committees as may be found necessary.

The by-laws adopted are as follows:

ARTICLE I—MEMBERSHIP

Section 1—The membership shall consist of two classes, active and associate.

Section 2—Any person, co-partnership or corporation of good standing and engaged in the sale of automobiles in and about the city of Chicago shall be eligible to active membership, and such person co-partnership or corporation shall be entitled to but one vote.

Section 3—Any person, co-partnership or corporation of good standing, engaged in and about the city of Chicago in the sale of automobiles, parts or accessories, or representatives of the trade press, shall be eligible to associate membership.

Section 4—Applications for membership must be by letter addressed to the secretary of the association, signed by the applicant and endorsed with the approval of at least two active members of the association.

Section 5—The affirmative votes of a majority of the executive committee present at the particular meeting shall be necessary for the election of members. Each candidate upon receiving notice of his election shall within 10 days remit to the treasurer, dues for the then current year.

Section 6—The annual dues shall be, for active members \$10 and for associate members \$5, payable on July first of each year.

Section 7—Any member who neglects to pay his annual dues for 30 days after due notice of default, to be sent by the treasurer to all delinquents on August first, shall be deemed to have forfeited his membership, and such member can only be reinstated by a majority vote of the executive committee, present at the particular meeting and after full settlement of delinquent dues.

Section 8—A majority of the executive committee shall have power to suspend members for any wilful infraction of any by-law or rule of the association or for actions or conduct which they may deem hostile to the interests of the association. Prior to such suspension of a member he shall be entitled to notice and a hearing before the executive committee.

Section 9—Upon recommendation of the executive committee at any special or regular meeting of the members of the association, a majority of the members present shall have power to expel a member, opportunity for a hearing having been afforded him.

Section 10—All members expelled for any cause shall be deemed to have expressly waived, and by

application for membership do waive all further rights of membership and all claims to recover fees or charges paid to the association and for damages for, or because of, expulsion.

ARTICLE II—GOVERNMENT

Section 1—The officers of the association shall be a president, a vice-president, a secretary and a treasurer.

Section 2—The general management and control of the affairs, funds and property of the association shall be vested in an executive committee consisting of the president, vice-president, secretary and treasurer and seven members in good standing, to be elected by the association.

Section 3—The members of the executive committee shall be elected at the annual meeting of the association to be held at the call of the executive committee, to hold for a term of 1 year or until their successors are elected. If a member of the executive committee is absent from three consecutive meetings, the committee may declare his office vacant, or ask him to resign unless he is absent from the city on business, when it will be necessary for him to notify the secretary in writing.

Section 4—The regular meetings of the executive committee shall be held at such places and upon such dates as the committee shall direct.

Section 5—Special meetings of the executive committee may be called at any time by the president, and shall be called by him whenever two members of the executive committee shall request him to do so, upon 5 days' notice of the date, hour, object and place of such special meeting, served upon each member either personally or by mail.

Section 6—Not less than six members of the executive committee shall constitute a quorum, but any less number attending shall have power to adjourn to a stated day and place.

Section 7—The executive committee shall manage the affairs of the association, as may seem best calculated for the interest of the association, and the officers of the association shall be the officers of this committee.

Section 8—If any vacancy shall occur in the executive committee such vacancy may be filled by majority vote at a meeting of the association, and the member so elected shall serve for the unexpired term of the member to whose place he shall have been elected.

ARTICLE III—MEETINGS

Section 1—The annual meeting shall be held in the city of Chicago between the dates of June 1 and 15 at the headquarters of the association. Notice of the time and place of such meeting shall be mailed to each member by the secretary at least ten days before such meeting.

Section 2—Special meetings of the association may be called by the president or upon the request of the executive committee, or the written request of five active members, and a notice of the time and place of holding such meeting must be sent to each member at least ten days prior thereto. At such special meetings only the special business shall be considered for which the meeting was called, notice of the same being included in the call sent to members.

Section 3—At all meetings of the association ten active members shall constitute a quorum.

Section 4—If a quorum shall not be present the presiding officer may adjourn the meeting to a day and hour fixed by him, with the same effect as if held as above provided.

ARTICLE IV—ORDER OF BUSINESS

Section 1—The order of business at all meetings of the association shall be as follows: Minutes, report of officers, reports of committees, unfinished business, elections, general business.

ARTICLE V—ELECTIONS

Section 1—The members of the executive committee shall be elected at an annual or special meeting of the association. The election shall be by ballot. Each active member of the association in good standing, not in arrears for annual dues, shall be entitled to cast one vote for each office, and a majority of the votes so cast shall be necessary to a choice. The polls should remain open

one-quarter of an hour and tellers shall be appointed by the presiding officer.

Section 2—Not more than 30 days nor less than 15 days prior to the date of the annual meeting the secretary shall submit to all active members a list of nominations for members of the executive committee, such list to contain the names of all members who shall have been nominated in writing by not less than three active members of the association.

ARTICLE VI—PRIVILEGES

Section 1—Every member in good standing shall have the opportunity of being heard at any meeting of the executive committee.

Section 2—Associate members shall be entitled to all the privileges of the association and shall conform to its constitution and by-laws and rules, but shall not have the right to hold office or vote.

ARTICLE VII—CONSTRUCTION OF BY-LAWS

Section 1—The decision of the executive committee shall be final upon all questions of the construction or interpretation of these by-laws.

ARTICLE VIII—AMENDMENTS

Section 1—These by-laws may be amended only by a two-thirds vote of all the active members present at the regular or special meeting of the association, the purport of the proposed amendment having been stated in the call for the meeting.

Section 2—On the adoption of these by-laws the association is authorized to proceed immediately to the election of officers and members of the executive committee.

ELECTION OF OFFICERS

Following the adoption of the constitution and by-laws a committee of three, consisting of Messrs. Dasey, Sykes and Porter, was appointed to make nominations. After a brief recess the committee made a report, but two of the gentlemen named declining to serve other names were substituted, the following ticket being eventually elected by the secretary being instructed to cast the unanimous ballot of the meeting: H. W. Jones, president; J. A. Linville, vice-president; Fred J. Pardee, secretary; Ralph Temple, treasurer, and W. L. Githens, Bernard Sykes, J. H. Phillips, R. H. Croninger, C. P. Root, P. J. Dasey and H. A. Mack directors.

SECOND-HAND CARS

A general discussion of plans ensued, the most important proposed being the organization of a board of appraisers to pass upon the value of second-hand vehicles offered in trade. A motion was eventually adopted to the effect that it was the desire of the meeting that this matter be given full consideration by the executive committee.

TRADE MISCELLANY

Knight Bros., 187 and 189 East Huron street, Chicago, have been appointed Cook county agents for the Merkel motor cycle.

Charles J. Weldon, of Rockford, Ill., has decided to build electric automobiles, and expects to get work started by September 1.

The Joseph Dixon Crucible Co., of Jersey City, N. J., sends out a little booklet with an interesting story about Dixon's pipe-joint compound, showing how both dollars and trouble may be saved by its use.

Catalogue B, of the Cortland Forging Co., of Cortland, N. Y., contains descriptions of drop forgings and electric welded carriage hardware, bow socket joints, shifting rails, arm rails, top joints and canopy top standards.

The De Loura Automobile Mfg. Co., which was organized in Fort Dodge, Iowa, last week, with a capital of \$30,000, has elected the following officers: President, J. H. Abel; vice-president, L. E. Armstrong; secretary and treasurer, F. C. Minogue; manager, H. E. De Loura.

THE READERS' CLEARING HOUSE

EXAMPLES OF FAULTY CONSTRUCTION

Chicago, Ills.—Editor MOTOR AGE—My experience with a home-made gasoline runabout may interest other readers of MOTOR AGE. I purchased a complete running gear, a $4\frac{1}{2}$ -horsepower, horizontal, single cylinder and a speed transmission of the planetary type with two forward speeds and a reverse. Being the owner of a machine shop devoted to a different line of work, the assembling of the machine was consequently done at a very small cost.

The water circulating system consisted of a tank of 5 gallons capacity, a six-tube radiator and a positive feed pump driven from the secondary shaft of the motor. Prior to putting the motor into the car it had been tested on blocks in the machine shop and seemed to work very well when running light, but of course with the charge throttled.

After taking the car on the road the motor would not run over 10 minutes before the water in the tank would boil and the motor overheat and stop. Another set of radiating coils was added, but with scarcely any better results.

Upon examining the motor the annular space of the water jacket chamber was found to be only $\frac{3}{8}$ of an inch wide, and the combined cylinder head and valve chamber was not water-jacketed. There apparently was the source of the overheating trouble, so the cylinder and head were taken off the motor and turned over to the pattern maker with instructions to increase the cylinder water jacket space to $\frac{5}{8}$ of an inch, and to also water jacket the cylinder head and valve chamber in the pattern for a new cylinder and head.

In about 3 weeks the new parts were ready for use and the car was taken out for another trial. This time there were no signs of the water boiling or the motor overheating, and a long run on a level road was made without difficulty.

The troubles were not over, however, for when a light grade was attempted with the car the motor slowed down and almost stopped before the end of the incline was reached. The normal speed of the motor was supposed to be 600 revolutions per minute and the motor was of $4\frac{1}{2}$ -inch bore and 6-inch stroke. The gear ratio between the motor and driving wheels should, on the slow speed, with the motor running at 600 revolutions per minute, have given a gait of 6 miles per hour and of 18 miles per hour on the fast speed. A test showed that the slow speed was a trifle under 5 miles per hour and the motor consequently only running about 480 revolutions per minute under a load.

The compression of the motor was next tested and was found to be poor, so the piston was taken out of the cylinder and the piston rings removed. They were found to be of equal thickness all round, instead of being turned eccentrically, and, further, had not been re-turned to fit the cylinder bore after splitting, but had been simply turned about 1-16 of an inch larger than the bore of the cylinder and then split.

A new set of rings was made, which were turned eccentrically, split, closed and re-turned to exactly fit the bore of the cylinder.

The compression was then found to be more than doubled, as far as could be ascertained by the extra effort required to carry the motor over the dead center with the starting crank.

After this improvement was effected the motor carried the car up a 20-per cent grade on the slow speed and at a rate of about $7\frac{1}{2}$ miles an hour with the spark advanced, showing that the increase in the compression by the use of properly designed rings had not only increased the motor speed from 480 to 750 revolutions per minute, but had in addition increased its power.—W. F.

DYNAMOS AND MAGNETOS

George, Ia.—Editor MOTOR AGE—I own a gasoline runabout and use the ordinary dry batteries, which do not prove satisfactory; and wish to inquire if small dynamos are used to any extent? It would seem that a good dynamo should give a more uniform current than a set of dry batteries. Is there any objection to the use of a small dynamo for ignition purposes. New dry batteries give a very good spark, but soon run down, and on a long run are apt to give out just when they are needed the worst.—J. P. De N.

Small dynamos and magneto-generators are in common use for ignition purposes, and are said to give very satisfactory results. It is necessary in some types to use some form of battery to start the motor with, after which the dynamo or magneto is switched on and the battery cut out.

SIMPLE SPEED GAUGE

Silver Lake, Ind.—Editor MOTOR AGE—Automobile manufacturers seldom fail to tell a purchaser that their cars are built to run a certain speed, but give no proof of their statements. Here is a simple rule that gives almost the exact speed of a car, without the expense of a speedometer:

Count the revolutions of one of the wheels for the time given, and the result is the speed per hour with a slight variation: 28-inch wheel, 5 seconds—being within .00116 miles at 20 miles per hour. 30-inch wheel, $5\frac{1}{2}$ seconds, or half the revolutions in 11 seconds—less $\frac{1}{2}$ mile at 20 or 1 mile at 40-mile rate. 32-inch wheel, 6 seconds—being within 1.43 revolutions per mile.

I have a small bell arranged to engage the star-wheel of my odometer at will, so that all that is necessary when the rate of speed is desired is to swing the trip on the bell so as to engage the star-wheel, count the taps for the time given above, according to the size wheel on the car and disengage the bell by swinging it away from the star wheel.—W. J. FITTON.

QUEER DRIVING INCIDENT

Pittsburg, Pa.—Editor MOTOR AGE—After nearly 2 years' running of a steam car I had an experience yesterday which only good luck prevented from being a disaster. This model steers with a tiller, held in the left hand, and the throttle is controlled by a crank moving in a horizontal plane, being set on the upper end of a vertical shaft. This crank points straight forward when the throttle is closed, and square to the left, or towards the driver,

when full open. A wooden knob on the outer end of this crank may be struck by the tip end of the steering tiller, unless the latter is elevated above the crank, when the tiller is pushed hard to right in turning the vehicle towards the left.

I was driving this rig on city streets recently, wearing a pair of light leather gauntlet gloves. I turned a corner to the left, into a street having a trolley track, and owing to standing wagons on right side of this street, I tried to keep between the track and left curb. In making the sharp turn I raised my left hand to pass over the knob on throttle crank, but in moving hand back to straighten up after the corner was passed, the loose gauntlet of glove caught on the knob, pulling throttle wide open, and causing the rig to leap forward. The glove prevented the left hand from coming back to central position of the tiller, and the car continued to turn in toward the curb, and directly toward a large telegraph pole. Instinctively I pushed as hard as I could on the crank with my right hand to close the throttle, and at same time pulling equally hard the other way with my left hand, to bring the tiller central. The two movements balanced each other, preventing any movement of either lever. The only thing which saved me was the ripping out of the lining of the gauntlet, which let go just in time. The front wheel swung straight just in time to come flat against the curb, gritting savagely for an instant, and the incident was ended. The wheel did not strike hard enough to dish it, and I don't think the tire touched at all, as the rim projects a little beyond the rubber. Had the sewing of the glove held for another second, however, I should have had a badly smashed condenser at least, and probably other damage. I am going to saw off the throttle crank back of the knob, making it short enough to miss the end of tiller under any condition, and I advise other users of this pattern of car to look out for this possibility in their running. Immunity from accident is likely to cause carelessness, and I confess I have felt a feeling of contempt for the skill of the driver, whenever I have seen a motor car with mashed up front. Next time I meet such I shall say to myself, "There, but for the weakness of a leather lining, is what I should have come to!"—R. W. B.

MOTOR SPECIFICATIONS

Cleveland, O.—Editor MOTOR AGE—Will you kindly give me the following dimensions for a gasoline motor of 5-inch bore and 6-inch stroke, and also state what horsepower the motor should develop at the highest practical speed: Correct diameter and dimensions of the rim of the fly wheel; proper thickness of the cylinder walls; the number of cubic inches required for the compression space or its proportion of the piston stroke; diameter of inlet and exhaust valve openings, also diameter of inlet and exhaust pipes.

How far should the piston be from the end of the stroke when the exhaust valve commences to open and when should the exhaust valve close? What should be the correct pitch for the teeth of a sliding gear transmission, and how should the teeth be cut so as to slide in and out of mesh easily, and how close should the gears be set so as to effect the change without noise?—C. D.

The fly wheel should be 18 inches in outside diameter and its rim 3 inches wide and 2 inches thick, giving a rim weight of about

100 pounds. The cylinder walls should be $\frac{3}{8}$ -inch thick. The number of cubic inches required for the compression space will be 29.4, or a clearance equal to one-fourth of the piston stroke. The inlet and exhaust valve openings should be $1\frac{1}{4}$ -inch diameter, and the inlet pipe $1\frac{1}{4}$ -inch and the exhaust pipe $1\frac{1}{2}$ -inch internal diameter. The piston should be about 7-16 of an inch from the end of the stroke when the exhaust valve commences to open, and the exhaust valve should close when the piston is exactly at the end of the exhaust stroke. The correct pitch for the teeth of a sliding gear transmission to use with such a motor should be No. 6 diametral pitch. To insure the teeth engaging properly in mesh, they should be turned off on the sides to a quarter-round with a radius equal to half the depth of the teeth. The gears should always be set on their correct pitch circles; that is, the centers of the gears should be equal to half the sum of the diameter of the two gears. As the change from one pair of gears to another must be made while the gears are in motion, it is almost impossible to effect the change without noise. A motor of 5-inch bore and 6-inch stroke should develop $7\frac{1}{2}$ horsepower and 750 revolutions per minute. This gives a piston velocity of 750 feet per minute, which is about the practical working limit for a motor of 6-inch stroke.

PUTTING IN MUFFLER CUT-OUT

Chicago, Ill.—Editor MOTOR AGE—Being a constant reader of the Readers' Clearing House, I would like to know how to attach a muffler cut-out to my gasoline machine? It is of the vertical, two-cylinder type, with the muffler and exhaust pipe connected similarly to the method used on the French machines.—R. E. H.

A three-way cock may be put in the exhaust pipe at any suitable point between the motor and muffler; or a tee connection with nipple and butterfly valve. Either of these devices may be operated from the seat by means of a rod and lever attachment to the stem of the cock or valve.

USE OF PICRIC ACID

Newburg, N. Y.—Editor MOTOR AGE—Being an interested reader of MOTOR AGE, I would like to make an inquiry about picric acid. What is the proper amount to use per gallon of gasoline?—C. A.

About 3-10 of a pound of picric acid should be used in each gallon of gasoline. Allow the mixture to stand about two days before using, agitating occasionally during this time; then strain through two or three thicknesses of fine muslin before using.

MOTOR CYCLE CONSTRUCTION

Hartford, Conn.—Editor MOTOR AGE—Would it be possible on a motor cycle to use a gear on the motor shaft engaging a gear on the driving sprocket shaft, to be thrown in and out of mesh by a lever near the handle bar, operated in a manner similar to the action of a sliding gear or clutch on an automobile? Could the cylinder head of a bicycle motor, which is usually held in place by hinged bolts attached to the crank chamber, be held in place by long bolts screwed into the crank-chamber instead of the hinged bolts, and would it make the cylinder head as tight a fit? Why is it that nearly all ordinary chain-driven motor cycles have a counter-shaft in the transmission, while track machines always have a direct drive?—J. J. O'C.

A clutch of the friction type might be used

for this purpose, but it would be entirely impracticable to use a sliding gear for this purpose.

There is no objection to the use of long bolts screwed into the crank case to hold the cylinder head in place; in fact, some makes of cycle-motors have such a construction.

The reduction required or the ratio between the driving and driven sprockets with a direct drive, would make the driven sprocket wheel of too large a diameter for ordinary road use. The track machines have a direct drive to give a high gear for racing purposes, which would not be practical for ordinary use.

CONNECTING ROD LENGTH

Columbus, O.—Editor MOTOR AGE—Would it be proper to use a connecting rod which is only $2\frac{1}{2}$ times the length of the piston stroke? The motor is of the high-speed four-cycle type and of 5-inch bore and $5\frac{1}{4}$ -inch stroke. The connecting rod bearing is of ample length and central with the rod.

I notice that some gasoline motors of the opposed-cylinder type have the wrist pin and crank pin bearings out of line with each other. Does not this put a heavy twisting strain upon the connecting rods and bearings? Is this type of construction all right?—A. S. J.

The usual rule for the length of a connecting rod is, that it should not be less than $2\frac{1}{2}$ times the length of the piston stroke, but there are a number of gasoline automobile motors working successfully with connecting rods of shorter length. There are at least three well known makes of gasoline automobile motors with opposed cylinders, using the offset construction described and apparently without any bad results from twisting strains upon the connecting rods and bearings.

STEAMERS FOR NOVICES

Atlantic, Ia.—Editor MOTOR AGE—Many people no doubt are looking forward to the day when automobiles will be sold so cheaply that one can be had for at least what a fair horse and buggy costs.

The writer—having a great love for anything in the mechanical line—has been one of that numerous class, but getting along in years the possibility of having to wait too long caused me to buy a machine as soon as possible. So last September a trip was made to Chicago to learn what could be done with a small amount of money and a great big desire to own a self-propelled vehicle.

I was perfectly ignorant as to the use of a gasoline engine. About 18 months before parties here had bought a gasoline car—they had never seen one but for a few hours, let alone run one—and proceeded to learn its peculiarities on our public streets to the amusement of our people and at the expense of the reputation of the machine, which in consequence received a body blow.

The question as to whether to buy a gasoline or steam machine was settled in favor of the latter, so the search for a good second-hand steamer begun. A small want ad brought many answers and developed the fact that gasoline machines were more popular, while steamers were being thrust aside. Having owned and used vehicles of different kinds for the past 35 years, it was only necessary to look at a carriage to see whether it was in fair condition, then having some mechanical knowledge it was comparatively easy to see whether a machine was originally well built and had not been used too hard. After deciding upon

one out of the many the next thing was to have done a little repairing that had been provided for in the purchase. A place was sought where all the ills and ailments of an automobile could be correctly diagnosed and the proper remedy applied, but a little experience showed the hospital lacking in both necessary skilled mechanics and tools, so the machine was shipped home to western Iowa and I started in to make myself familiar with it and its use.

Our country is hilly and the roads mostly in a natural state. The little machine underwent some severe tests. Weaknesses were developed but nothing that could not be readily repaired and that at a nominal expense. Many pleasant hours have been spent in working with the machine. It has been run all over the county and no hill is too steep for it to surmount. Of course mud knocks it out. I have not had a tire puncture since I begun to run it. If it does not go one can see at a glance why "nothing is doing." My candid advice to one who is waiting for machines to become cheaper is to buy a steamer now, while cheap, and have the pleasure of testing one's liking for automobilism.

I have endeavored to give most every one a ride who shows any desire to try the car, and all express themselves as charmed with the experience, especially after watching the bobbing and shaking hats and feathers of those who have sat in the gasoline machine.

It goes without saying that there are many who should not invest in a steamer, neither should every one drive a horse.

The only difference between that class, in a horse drawn vehicle and a steamer, is, they would come to grief sooner in the latter. Another bit of advice—don't quit the horse for an automobile unless you are satisfied to be spoiled for horse driving in the future.—W. C. E.

STEAM ENGINE HORSEPOWER

Toronto, Can.—Editor MOTOR AGE—Will you inform me through the Readers' Clearing House what horsepower a double-cylinder steam engine of 2-inch bore and 3-inch stroke will develop—H. J. C.

With a mean effective pressure of 120 pounds per square inch and cutting off at one-third stroke, such an engine should develop about $6\frac{1}{2}$ horsepower at 600 revolutions per minute.

BELT AND CONE PULLEY DRIVE

Decatur, Mich.—Editor MOTOR AGE—Has a belt and cone pulley speed transmission ever been used on a gasoline automobile, and, if so, with what results?—A. E. L.

MOTOR AGE does not know of any machine equipped with belt and cone pulley transmission that is in use, although there are numerous patents on such devices.

MOTOR CASTINGS

Rock Island, Ill.—Editor MOTOR AGE—I would like to know where I can obtain a set of castings of the motor described in MOTOR AGE of April 9.—R. S.

MOTOR AGE does not know of any one making these castings. The drawing of this motor was published upon the request of a reader.

HEAT DEVELOPED BY TWO-CYCLE MOTORS

Louisville, Ky.—Editor MOTOR AGE—Does a two-cycle motor running at the same speed use twice as much battery current as a four-cycle motor? Does not a two-cycle motor give

off more heat than a four-cycle motor of the same size?—H. N. W.

A two-cycle motor will use twice as much battery current as a four-cycle motor, as twice as many sparks have to be produced during the same number of revolutions. The amount of heat developed by a two-cycle motor is not much greater than that given off by a four-cycle motor, as the charges are not as rich or under as high a degree of compression as those in a four-cycle motor.

LOSS IN CHARGING

Philadelphia, Pa.—Editor MOTOR AGE—Is there any loss in charging a storage battery from a 110-volt light circuit, and if so what is the percentage of the loss?—T. W.

If a storage battery of 80 volts be charged from a 110-volt light circuit the efficiency of the charge would be 80 divided by 110 or 73 per cent; which, inversely, is a charging loss of 27 per cent. If a 50-volt battery is charged from the same circuit, the loss would be about 54 per cent.

HOME-MADE MUFFLER

Scranton, Pa.—Editor MOTOR AGE—The accompanying drawing shows a muffler which I recently had made after a design of my own for my gasoline runabout. It is almost noiseless; in fact, more so than any other muffler that I have so far seen, and is practically without back pressure, as with the muffler cut out, the motor will not increase its speed over 3 per cent.

It consists of a series of cones and cups placed alternately, as shown in the drawing. The exhaust gases enter through the first cone, and are deflected or diverted by the first cup, to again enter a succeeding cone and be again diverted, thus breaking up or utilizing the force of the exhaust gases which emerge from the outlet of the muffler practically dead and inert. The end covers can be made of aluminoid and the outer casing or shell of No. 18 B. W. G. sheet iron. The cones and cups may be made of somewhat lighter material than the casing and should be assembled and riveted together as shown in the drawing.—J. E. W.

LEAKING GASOLINE TANK

Cleveland, O.—Editor MOTOR AGE—I have recently experienced trouble on account of the water and gasoline tanks of my automobile leaking around the rivets; in fact, very badly in some places. Can you inform me as to the cause of this trouble? The tanks are made of galvanized iron and the rivets are of copper.—T. W.

The trouble is caused by a galvanic action taking place between the copper rivets and the zinc on the galvanized iron. Copper or brass tanks should always be riveted with copper rivets and iron tanks with iron rivets.

TO PREVENT ACID SPILLING

Dayton, O.—Editor MOTOR AGE—Can you suggest some method by which I can prevent the acid in the storage batteries of my electric

vehicle from spilling through the gas vents in the top of the cells, when riding on rough roads? This acid corrodes the terminals badly. The vents are small holes in the top of the hard rubber caps which screw on tubes projecting about 1 inch above the top of the cells.—T. K.

The spilling of the acid may be prevented by placing pure rubber nipples over the hard rubber caps. These nipples may be readily obtained at any drug store.

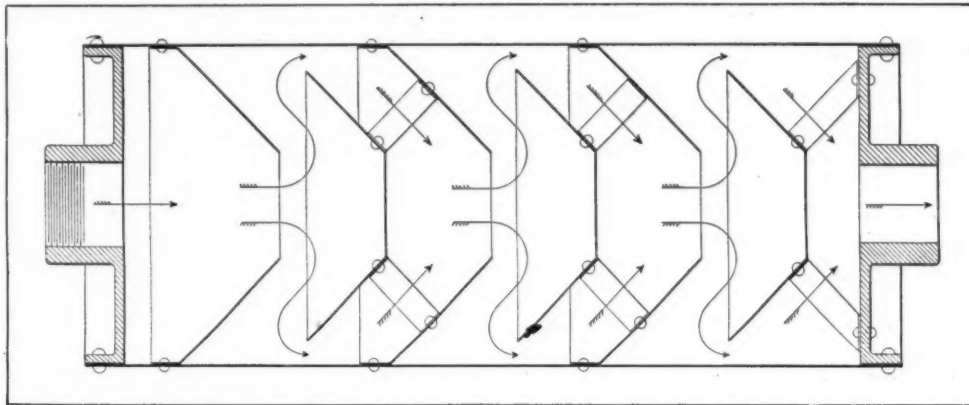
INCREASING MOTOR COMPRESSION

Winnipeg, Can.—Editor MOTOR AGE—I would like to know the proper length of the compression space in a four-cycle gasoline motor of 4½-inch bore and 5½-inch stroke. I have such a motor, in which the compression space is equal to half the stroke of the motor. With a higher degree of compression would not the motor be more powerful?—A. L.

The length of the compression space for a motor of 5½-inch stroke should not be greater than 1½ inches. A higher degree of compression will make the motor far more powerful.

OBVIATING THE DIFFERENTIAL

Franklin, Ky.—Editor MOTOR AGE—Is there any method by which the differential gear generally used may be dispensed with?—R. S.



Pawl and ratchet and coaster brake types of free wheel devices have been used for light cars without reverse drive gearing; also double acting ratchet device in the hubs of the driving wheels for cars fitted with reverse. The objection to all these devices is that power is transmitted to only one of the driving wheels, the other running idle when turning a corner.

CHARGING WITH PLATING DYNAMO

Dallas, Tex.—Editor MOTOR AGE—Can I charge a three-cell ignition storage battery from a 10-volt plating dynamo as well as from a 110-volt light circuit, and will a lamp resistance be necessary?—J. F.

A plating dynamo of 10 volts is better adapted to the purpose than a 110-volt light circuit; the only reason the light circuit is more used is that plating dynamos are not often convenient. No lamp resistance is needed.

LIGHT CHANNEL STEEL

Philadelphia, Pa.—Editor MOTOR AGE—With regard to the inquiry of T. K. of Los Angeles, Cal., for light-weight channel section for an automobile running gear, I have on hand a few lengths of 2-inch by 1-inch channels, 17 feet long, weighing about 2½ pounds per foot. These were rolled specially for automobile use.

Price and further particulars may be had upon application.—F. W. Reese, 2009 Ogden St.

MAKING A LAUNCH MOTOR RUN

Chicago, Ill.—Editor MOTOR AGE—A few days ago I was called upon by a friend of mine to find out what was wrong with his gasoline motor launch, the motor of which had positively refused to work since the day he got it. Upon arriving at the scene of the trouble, the boat was found to be a 16-footer and equipped with a vertical, four-cylinder motor of 10 horsepower and with an 18-inch, double-blade propeller of the reversible or feathering type.

An investigation showed that the four secondary wires leading to the spark plugs were of ordinary light circuit wire and without any other insulation, and were carried in a brass tube, supported by two small brackets attached to the cylinder heads. As a pier in the lake was not a very fruitful source of supplies, the handle of a broom was impressed into service and a piece of the required length cut off and fastened to the small brackets in place of the brass tubing. The secondary wires were then fastened to this improvised insulator or non-conductor, so that there was no chance of leakage between them or of a ground to the motor, which without doubt existed in the case of the brass tube, which was fitted before.

The ignition mechanism was next inspected, and the commutator was found to be so set that the point of early ignition was slightly after the pistons had passed their upper dead-centers and were on their downward strokes, the points of late ignition being nearly one-third of the way out on the downward strokes of the pistons. After the timing of the ignition

had been properly adjusted and the wiring from the quadruple coil to the motor and batteries put in shape, the motor was started, the propeller thrown in gear and the 16-footer went out into the lake at an 8-knot gait—so fast indeed that as there was quite a swell on, the boat shipped more water than the bilge pump could take care of and consequently made fast running dangerous.

A local expert who had been also called upon to put the motor in shape had said that the only thing wrong was that the batteries were no good.—B. L.

SAFE LOAD OF TUBULAR AXLES

Seattle, Wash.—Editor MOTOR AGE—Will you inform me through the Readers' Clearing House what load a seamless tubular axle, 1½-inch diameter and with 3-16-inch wall, should carry? The wheels are of 54 inches track, center to center and the springs 36 inches apart.—S. M.

Under the above conditions and with a fiber stress of 15,000 pounds per square inch, the tubular axle should carry two loads of 415 pounds, one at each spring seat, or a total load of 830 pounds.

The Swiss Automobile Club has a membership of 439. The club members own 550 cars.

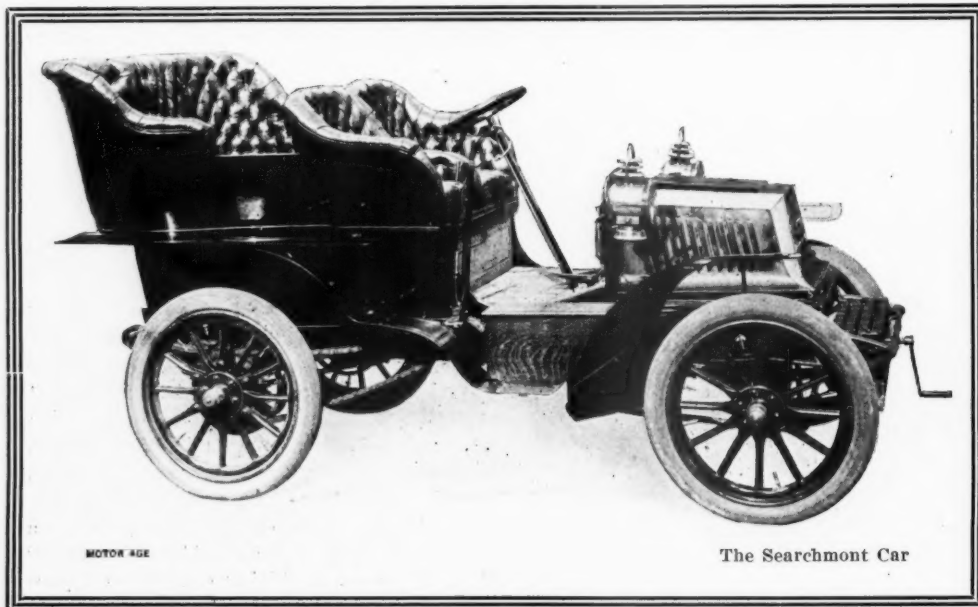
IN THE FIELD OF AUTOMOBILE DEVELOPMENT

A NEW CHICAGO CAR

Clyde P. Warner, 95 Dearborn street, Chicago, is just now endeavoring to organize a company to manufacture a small gasoline car which has the earmarks of possible popularity. The vehicle was designed and built by E. Wall, a Chicagoan, who has been interested in automobile construction for a considerable time, and is of that style which has, in the few instances of its adaptation in this country, proven very acceptable, both to the trade and public. It is a 6-horsepower machine with a vertical motor in front under a square hood, and with sliding gear transmission, propeller shaft and bevel gear final drive, wheel steer and other constructional elements usual to large cars, but not until recently made a feature of small vehicles, at least in America.

The frame is rectangular, or angle steel, and is supported upon four full elliptical springs. In future models, however, these may be replaced with the usual semi-elliptical springs. The axles are tubular. The wheels are of the artillery pattern, wood and 28 inches in diameter with 3-inch tires. The wheel base is 5 feet 9 inches, and the track is standard. The front wheel hubs are fitted with ball bearings, while in the rear plain bronze bushed bearings are employed. The weight of the entire car is 800 pounds. The body is of conventional, readapted touring car style, with continuous mud guards over front and rear wheels to still further convey the impression of heavy car design.

The single cylinder vertical motor is conventional in design, although of home construction. It is supported by an angle steel sub-frame dropped from the side bars of the main frame of the running gear. The bore and stroke are but 4 and 4½ inches, respectively, but the engine is run at comparatively high speed, the normal speed being from 1,200 to 1,400 revolutions, with a maximum speed of 2,000 revolutions per minute. The crank case is of aluminum. Jump spark ignition with vibrator coil and batteries is employed. The carbureter is of the float feed pattern. There is no governor, both spark lead and throttle being manually controlled. The controlling mediums are small handles upon the steering wheel post. The water circulation is by the natural or so-called thermo-syphon system, without pump and with a combined tank and



The Searchmont Car

radiator ahead of the motor under the bonnet. An auxiliary tank is carried back of the motor. The batteries and gasoline tank are under the seat.

The power is transmitted through a cone friction clutch to a three-speed forward and reverse transmission gear in an aluminum case under the foot board of the car. The speed changes, instead of being made by the ordinary side lever, are made by a handle upon the steering wheel post, but are in a way controlled by the pedal that actuates the clutch. In other words, the clutch pedal operates through a locking quadrant which locks each speed change set of gears until the clutch is released, making it impossible to change speed without throwing out the clutch. The same pedal also controls the drum band brake on the propeller shaft, although there is an intermediate point in its movement at which the clutch is released without the application of the brake. There are no hub brakes.

The propeller shaft is provided with an universal joint at each end, while the normal distance between the rear axle and the transmission gear is maintained by two oblique radius rods extending from the gear case to the respective ends of the axle. The differential gear is upon the rear axle. The speed

ratios of the transmission are four and one-half to one, eight and one-half to one and twelve and one-half to one for forward drive, and fourteen to one for the reverse drive. The transmission is direct upon the high speed. A maximum road speed of 30 miles an hour is claimed, with an operating radius on one charge of 100 miles.

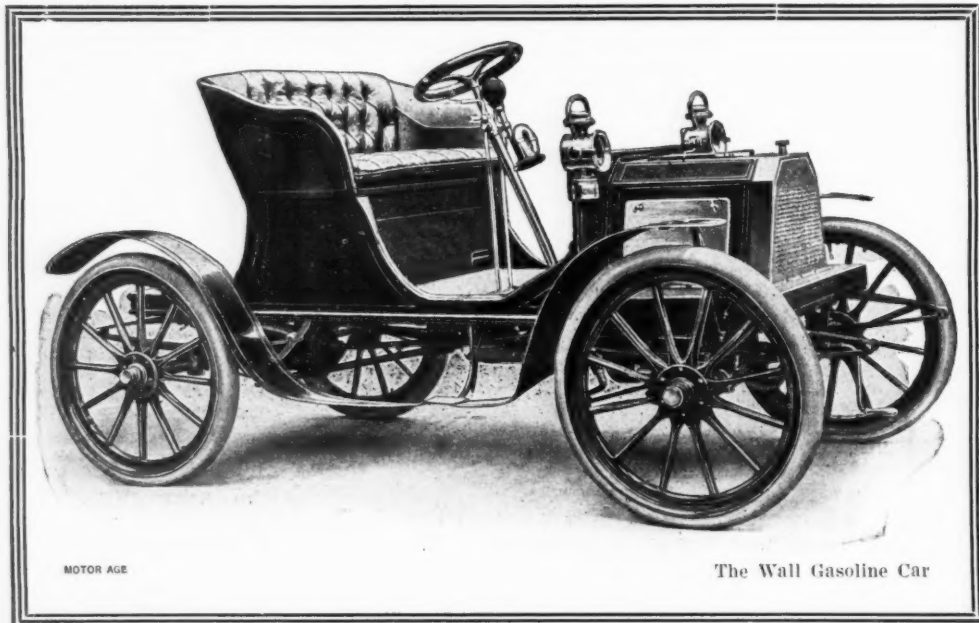
GENERAL DELIVERY WAGON

The illustration shows a delivery automobile just constructed for Barie Bros., of Saginaw, Mich., by the General Automobile & Mfg. Co., of Cleveland, Ohio. The mechanical features do not differ from the General runabout. The power is supplied by a two-cylinder motor, with gasoline fed by an adjustable diaphragm carbureter with automatic feed. The lubrication is also automatic. The transmission is of the sun and planet type and the control is secured by frictional brake bands, which are operated by a single lever for forward changes, and by a treadle for reverse. These parts are made exceptionally heavy. The length of the wagon over all is 9 feet 8 inches; width over all, 5 feet 9 inches; wheel base, 6 feet 6 inches; tread 4 feet 8 inches. The inside dimensions are 4 feet 3 inches long, 3 feet ¼ inches wide and 3 feet 5 inches high. The wagon will carry 3,000 pounds easily. The woodwork is ash and is painted red.

SEARCHMONT TOURING CAR

The Searchmont, type 7, gasoline touring car, made by the Searchmont Automobile Co., of Philadelphia, Pa., is one of the prominent American made cars of French style, embodying all the salient points of the latest European design, but without the usual complication of the latter.

The front seats are individual, and the tonneau exceedingly roomy and comfortable. An extra seat attached to the door of the tonneau is also provided, which folds up out of sight. The main frame of the running gear is of ash, reinforced with 3-16-inch steel plates. The motor and transmission are carried upon a 1½ by 1½-inch angle steel sub-frame. The springs are made of Swedish steel, carefully oil tempered. The front springs are 36 by 1½ inches and the rear springs 40 by 1½ inches, making the car one of the extremely easy-riding kind. The wheels are of the wood artillery



The Wall Gasoline Car

pattern, with cast steel hubs and phosphor-bronze brushing, and fitted with 32 by 3½-inch detachable tires.

The steering knuckle posts are inclined and the front wheels staggered to make the turning point of the steering knuckles coincident with the tread of the front wheels at the ground. The wheel base of the car is 6 feet 9 inches and the track 4 feet 8 inches. The car is 11 feet 7 inches long and 5 feet 8 inches wide over all. The body is upholstered with the best quality of hair and leather, and finished in ox blood or olive green with gold stripes and brass trimmings.

The motor is of the vertical two-cylinder pattern, of 4½-inch bore and 5-inch stroke and of 10 horsepower. It is located in the front of the car under the bonnet. The motor is fitted throughout with phosphor-bronze bearings and all gears are enclosed in the crank chamber. The crank chamber has four doors which permit of the adjustment of the connecting rods or alignment of the bearings without taking the motor apart. The exhaust valve lifters are so arranged that they may be quickly removed, when necessary, by the unscrewing of two nuts. The exhaust valves are of nickel-steel and the inlet valves are located directly over the exhaust valves, so as to assist in keeping the latter cool.

The connecting rods are of drop forged steel and have phosphor-bronze bearings. The motor is supported by four arms upon the angle steel sub-frame of the running gear. Priming cups are located on top of the inlet chambers and directly above the inlet valve cages, and provided with plungers to open the inlet valves and admit the priming charge of gasoline into the combustion chambers. This is a very desirable feature for use in damp or foggy weather.

The ignition is by jump spark and the current is furnished by a small generator, which is belt driven by the fly wheel. The car is also equipped with batteries to use in starting



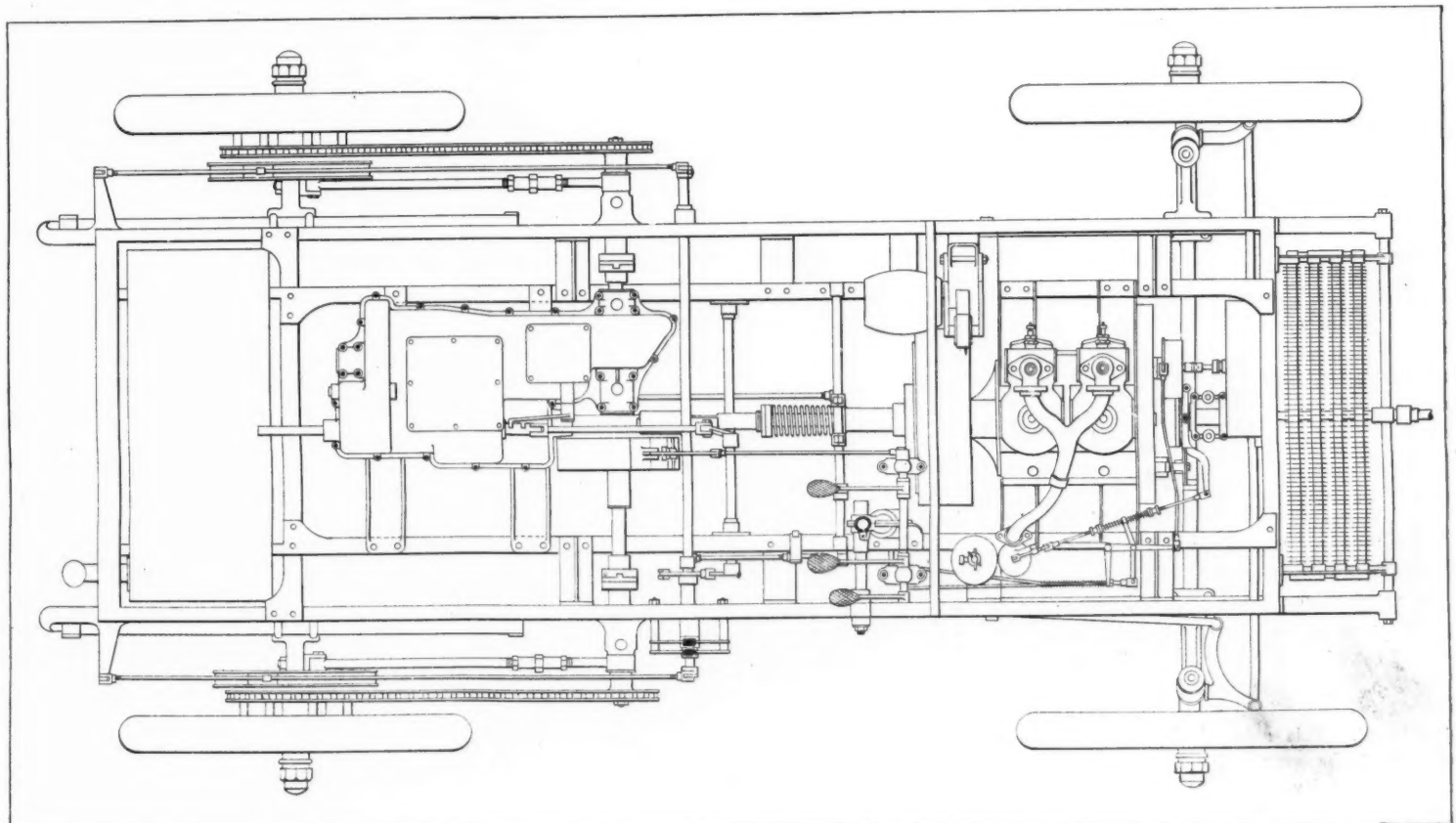
MOTOR AGE

The General Gasoline Delivery Wagon

the motor and in case of emergency, should anything happen to the dynamo. The dynamo and batteries are controlled by a switch on the dash of the car.

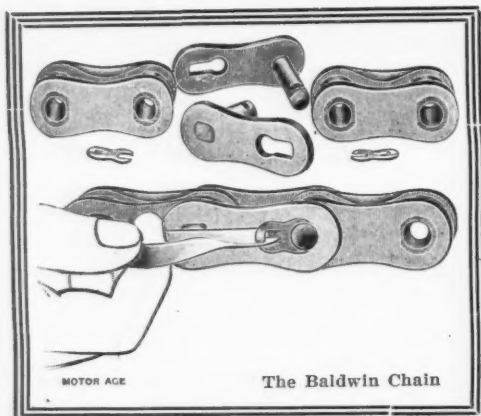
The carburetor is of the float-feed type, with a centrifugal governor acting upon the throttle to control the speed of the motor. The

throttle may also be regulated independently of the governor by means of a pedal operating a spring controlled lever. The commutator or ignition operating device is located in the front of the motor as shown in the plan view, and is fitted with a removable cover, which can be quickly snapped for examination of the brushes



MOTOR AGE

Plan View of Chassis of the Searchmont



and contacts. The ignition is automatically advanced by the governor, but may be controlled at will by the operator by means of a small lever.

The water cooling system consists of a geared pump, which draws the water from the 14-gallon tank in the rear of the machine, then forces the water through the cylinder jacket and back to the tank through the radiator located in the front of the car.

The speed transmission is of the sliding gear type, with cone friction clutch in the fly wheel. It has four speed forward and a reverse drive giving forward speeds of 7, 16, 24, 32 and 6 miles per hour for the reverse. The cone-friction clutch may be readily removed without disturbing the motor or transmission gear for the renewal of the leather face. The cone clutch is operated by a pedal controlled by the left foot of the operator.

The car is fitted with wheel hub brakes operated by a hand lever, and also a drum brake upon the secondary shaft controlled from a pedal near the operator's right foot. The secondary shaft, which transmits the power through the sprockets and chains to the road wheel is fitted with compensating joints, located next to the inner ends of the secondary shaft bearings.

The main bearings of the motor and speed transmission are oiled from a mechanical force feed lubricator, located in the front of the car under the motor bonnet.

Wheel steering is employed with worm and gear, and direct connection to the front right hand steering knuckle. The ignition control is located on the steering wheel post and within easy reach of the operator. The speed of the motor can be regulated from 250 to 1,200 revolutions per minute.

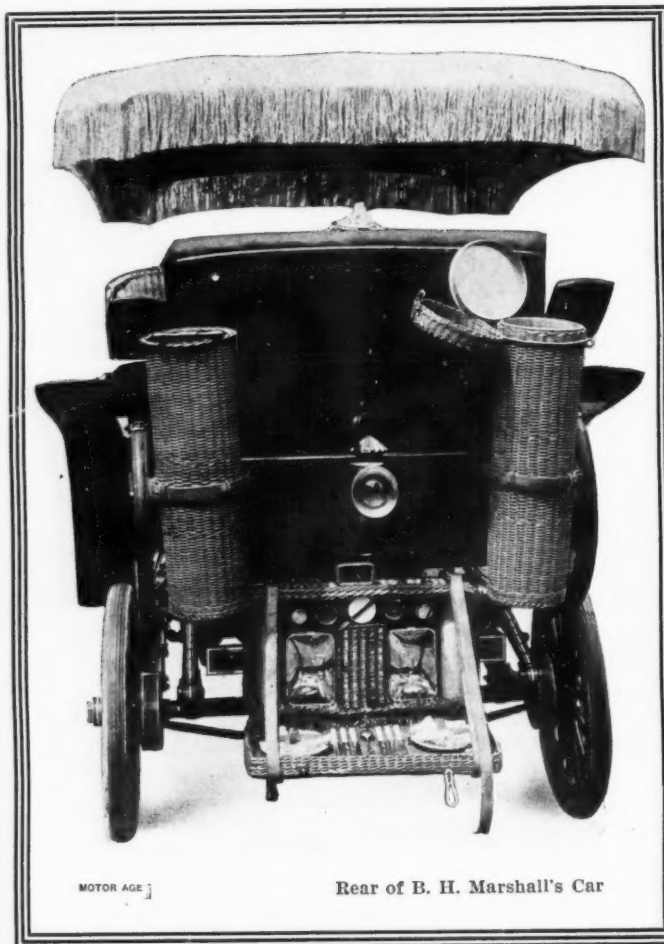
CAPTAIN UPTON'S NEW GEAR

Captain Colcord Upton has severed his connection with the Upton Machine Co., of Beverly, Mass., and has taken offices at 144 West Thirty-ninth street, New York, for the purpose of introducing a new transmission gear of the enclosed planetary type. The salient feature of this gear is the clutch for giving the high speed. This acts within a drum on the outside of the gear case and is entirely separate from the gears, which run in oil within the case. The clutch may be oiled as may be necessary, and is always accessible and easily

adjusted. Mr. Upton is also preparing to introduce a three-speed sliding gear transmission set in which all of the speed changes and the clutch will be controlled by a single, positively acting lever.

LATEST BALDWIN CHAIN

The Baldwin Chain & Mfg. Co., of Worcester, Mass., is introducing a detachable chain for automobiles which it claims will meet all requirements. In the construction of this chain each pin is riveted at one end and formed for a detachable connection at the other. The detachable and free ends come on opposite sides, so that the pull on the chain is even. A small steel tempered spring, the two jaws of which set under the head of the pin, and a small tongue which slips into the hole in the side link in which the pin is inserted, hold the free end of the pin in place in the link. There is one of these springs on each side of each link.



Should the user neglect to put one or both of these springs in, the chain would run like the old form of detachable chain, but with the spring in the makers claim it is impossible for the chain to separate on the road, or, if broken,

for any except the broken parts to separate.

A small tool is furnished with each chain, and with this the small lock spring may be removed and replaced. This tool is not necessary for removing the spring, but adds much to the convenience of handling the chain. The spring may be removed by any small tool, like a jack-knife or screw-driver.

This company also makes special sprockets to order and sprockets in quantities, and is now prepared to furnish bevel and spur gears of all kinds.

MELANGE OF VALVE POINTERS

One of the most important factors in the proper working of a gasoline automobile motor and one which perhaps receives the least attention, is the action of the valves.

Atmospherically operated or suction inlet valves should have springs of sufficient strength so that the valves will seat the instant that the piston starts on the compression stroke. Loss of compression and frequent backfiring into the carburetor are the results of inlet valve springs of insufficient strength. An inlet valve spring of large diameter and heavy gauge wire will give a quicker acting valve and a longer spring life than a spring of smaller diameter and lighter gauge wire. Both inlet and exhaust valve springs should be made of oil tempered, crucible steel wire.

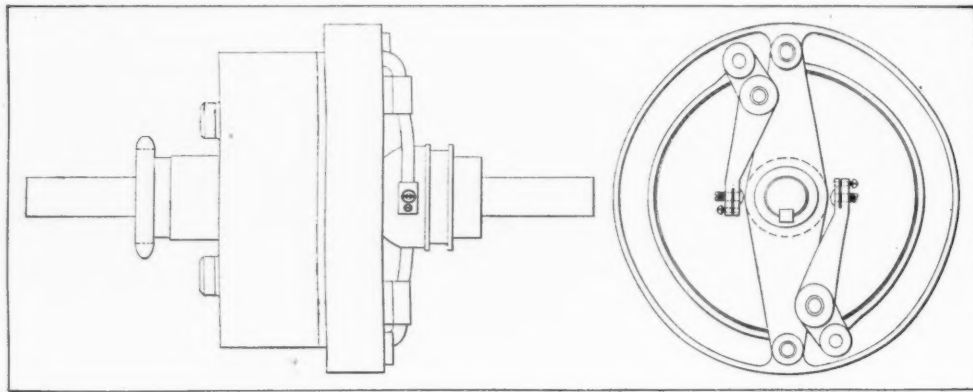
Neither inlet nor exhaust valve stems should have fixed guides, or in any manner be prevented from turning on their seats. Valves with such a construction will invariably leak in a short time and require frequent regrinding. The closing and opening of the valve spring gives a certain amount of rotary action to the valve upon its seat and prevents the accumulation of dirt or other deposit between the valve and its seat.

Inverted suction inlet valves require much stronger springs than horizontally located valves or valves with the stems downwards. Inlet or exhaust valves with flat seats give the same area of opening with a shorter lift than a level seat valve, but are much more difficult to keep tight.

Flour of emery and oil, unless in the hands of an expert, should never be used to regrind a valve to its seat. Tripoli and water, while

taking a little longer time, will give as good results, and without danger of scratching the face of the valve or its seat.

Mechanically operated inlet valves should open and close exactly at the start and finish



MOTOR AGE

Captain Upton's New Gear



MOTOR AGE

Marshall's Car Rigged for Touring

of the suction stroke of the piston, while the exhaust valve should open at a point distant from the end of the explosion stroke, equal to one-twelfth of the stroke, and should close exactly at the end of the stroke. For piston velocities of less than 600 feet per minute the valve openings should be not less than one-fourth the piston diameter, and for piston velocities over 600 feet per minute and not exceeding 1,200 feet per minute the valve openings should be not less than one-third the piston diameter.

To secure the best results, valve stems should always have a generous billet next to the head, and on no account should the head be turned out or counterclosed for the sake of lightness. A warped valve seat and probably a cracked head will generally be the result of the operation.

TOOLS FOR ROAD REPAIRS

Even with the most careful attention which may be bestowed upon an automobile, defects are bound occasionally to develop while on the road, and it is then that the mechanical ingenuity of the operator is taxed to its utmost. Despite the fact that the space available for tools is usually limited, with a judicious selection of tools, nearly all emergencies or road contingencies can be successfully met. In addition to the special tools usually supplied with a car, the following articles will be found of great use: A small pipe wrench, a pair of gas pipe pliers, a large and a small screw driver, a pair of flat-nosed pliers, a small hammer, a pair of wire cutters, a large jack knife, a flat, a half-round and a three-cornered file, a coil of soft iron wire, a roll of sticky tape, a cold chisel, a small ball pene hammer, a monkey wrench and some extra nuts and bolts.

ELABORATE BODY DESIGNS

Benjamin H. Marshall, a Chicago architect, is the designer of the bodies presented on the re-constructed Autocar shown in the accompanying illustrations. Mr. Marshall sought greater comfort than is afforded by conventional automobile construction and accordingly adapt-

ed the European style of C or coach springs. He retained the running gear substantially intact, but mounted the body upon entirely distinct springs, thus relieving the body not only of whatever road jar is compensated by the large C springs, but of the vibration of the motor and other running parts. Aside from providing a maximum of comfort the new construction furnishes an impressive and elaborate appearance.

Several changes whereby the general appearance of the carriage is radically altered may be effected. There was fitted either a body with a rumble seat for a footman or a double seat touring car body. There is a silk canopy top which may be used with either the Victoria or the touring car rig, and when not used may be folded and placed in a basket on the rear of the car. When the car is

equipped with the touring body it has a refrigerator and sideboard that fold into the rear seat. The refrigerator is fitted within a zinc lined basket, having a drain at the bottom, and accommodates bottles, fruit, etc., to a quantity ample for five persons.

The rear seats are not entered by a rear door, as in the ordinary tonneau, nor from the side as in a surrey, but through an opening between the sections of the divided front seat. The conventional motor bonnet is replaced by one of hammered wire, which is painted in imitation of rattan. The dash is provided with a door, so that the operator can inspect the engine without leaving the car. The car is finished in royal blue and black. The changes in the body can be made within a very few minutes, all of the parts being readily interchangeable without adjustment.

KELLS HONEYCOMB RADIATOR

The general adoption of the tubular or honeycomb radiators by the foreign manufacturers, and the assurance that this type of water cooler will be extensively used in this country on 1904 models, has induced a New Jersey manufacturer to market a radiator which embodies all the features of the foreign device, with several improvements made possible by American ingenuity.

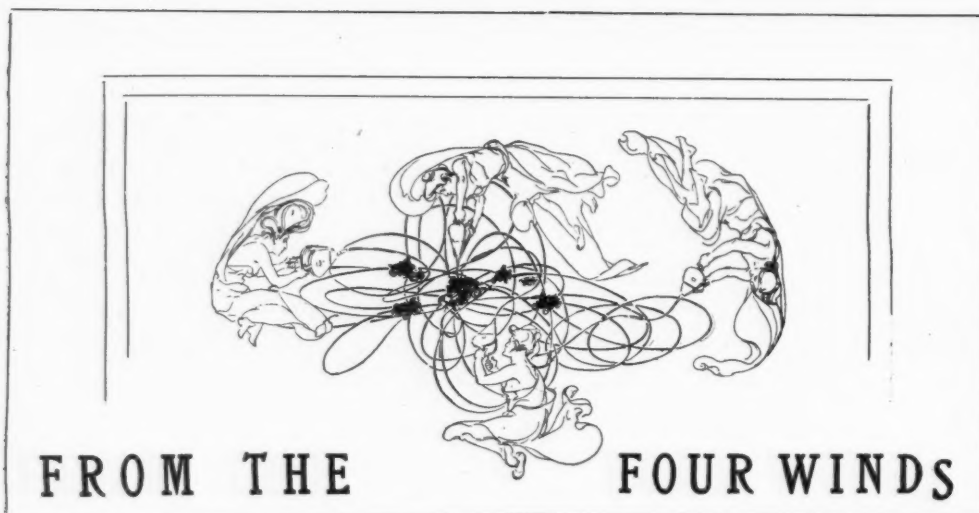
The tubular cooler on the Moyea car first seen at the New York show attracted more than ordinary attention owing to its fine workmanship. It was the product of W. J. Kells, of 130 Highland avenue, Jersey City, N. J., who has had considerable experience on automobile work. The tank attracted so much attention that Mr. Kells has decided to manufacture them in quantities for the trade. Since the show he has been filling orders for this type of cooler, and recently extended his facilities so that he is now able to figure with manufacturers for radiators for next year's cars.

It is likely that a big motordrome will be constructed at Spa, the watering resort of Belgium. The matter came before the city council recently and was regarded favorably. A company with a capital of \$250,000 will be organized to construct a track.



MOTOR AGE

Marshall's Car as a Victoria



Cape Town, Africa, will soon have a motor omnibus company.

Over 20,000 people are now employed in automobile building in France.

The Adams Express Co. has installed 13 electric automobiles to handle its business in Buffalo, N. Y.

Motor cars and motor cycles have been prohibited from being driven on the inner drives in Sefton park, Liverpool.

The gymkhana at Ranelagh, England, which was set for June 13, was indefinitely postponed on account of rain on that day.

J. H. Edsall, who has been with Sidney Shepard & Co., has been elected secretary of the E. R. Thomas Motor Car Co., of Buffalo, N. Y.

A kilometer race in Florence, Italy, on June 13, was won by Florio on a 70-horsepower Panhard in 36 seconds. A 40-horsepower Serpollet was second in 37 seconds.

The Belgian and French automobilists are happy because the new road between Ostend and Dunkirk by way of Neuport Furnes and Ypres-Menin is now open for motor traffic.

The trials of public service and parcel delivery motor vehicles will be held the first Monday in October under the auspices of the technical section of the Automobile Club of France.

Barney Oldfield and Tom Cooper will race at Marion, Ind., on July 9. The races are to be given under the auspices of the Elks' lodge. There will also be races of the local owners of cars.

Birmingham, Ala., now has automobile regulations making the speed in the city limits 10 miles an hour. Lamps must be carried at night. No license number is required on the vehicle.

Motor cycles are becoming quite common in Moscow and they may now be seen in all the bicycle shop windows, and they are also being extensively advertised. This last bit of publicity is probably the best reason why they are being so extensively used.

An automobile club has been organized at Ogden, Utah, with the following officers: O. J. Stilwell, president; A. P. Bigelow, vice-president; A. V. Withee, secretary; F. W. Baker, treasurer; John A. Smith, assistant secretary; F. H. Blooft, captain.

The General, which was entered in the endurance contest at Denver on Decoration day, was awarded a first class certificate. The car lost four points out of the 425 and these were caused by a broken connection in the battery circuit.

Evansville, Ind., has about twenty automobiles and none of the owners have as yet paid

the license fee of \$3 which the city has levied. The comptroller has announced that he will go after the entire lot and arrest them if they do not pay up.

The city council of Milwaukee, Wis., has decided not to prosecute any more cases of automobile owners who operate machines without a gong. There will be no further arrests until the council has acted upon a petition to permit the use of horns instead of gongs.

The Automobile Club, of Utica, N. Y., has organized with seventeen members. The officers are: Edward A. Bushinger, president; Fred D. Smyth, first vice-president; Robert M. Hunt, second vice-president; Harry H. Mundy, secretary and treasurer.

The motorists of Aurora, Ill., are organizing a club. About twenty-five persons have signified their intention of joining. An ordinance has been prepared in the city council making the speed limit 8 miles an hour inside the fire limits and 15 miles outside. The club will endeavor to modify these regulations.

The People's Rapid Transit Co., of Westerly, R. I., which has been operating three large passenger and two delivery automobiles, has discontinued operation because the field is not large enough to make the venture a financial success. The cars of the company have been placed in the hands of John P. Thompson, the president and treasurer of the company, and will be offered for sale by him.

The Southern Automobile and Cycle Club of Belleville, Ill., will hold its annual meet this year July 4. The leading event of the day will be the attempt by Messrs. Webb and Vance to lower the $\frac{1}{2}$ -mile track record with a steam racer. There will be two automobile races. The first will be a 3-mile handicap for machines under 9 horsepower, and the second will be a 5-mile open.

The Italian Automobile Club and the Automobile Club of Lombardy have decided to amalgamate and form one large club, to be known as the Italian Automobile Club of Milan. Chevalier Massoni is the president of the new club. The construction of a motordrome with a 12-mile run in the neighborhood of Milan is in contemplation.

The program for Ostend week which begins July 12 will be as follows: July 12—Speed races, about 100 kilometers; Ostend-Blankenberghe and return. July 13—Tourist trial on the same itinerary. July 14—Motor cycle race. July 15—Standing mile and flying kilometer races. July 16—Same races for tourist cars. July 17—Flower parade and elegance competition.

Guy C. Van Alstyne, formerly of Chicago, stranded with his automobile in the desert of Utah last week because his gasoline supply was exhausted. He left his companion, Henry M. Crowther, of Salt Lake City, to guard the machine and walked 22 miles to the nearest railroad station to get help. A wagon with a fresh supply of gasoline was sent to Mr. Crowther and the interrupted trip continued to Salt Lake City.

Dr. Charles H. Lemon, surgeon general for the Milwaukee, Wis., Electric Railway & Light Co., has an automobile that he uses in making fast time to reach emergency cases. The doctor has occasionally run over a few people as he was speeding down the avenues, and he always makes it a point to stop and pick up the victim and haul him to the hospital if necessary. A few days ago Dr. Lemon's automobile did the customary thing and bumped a portly brewer so hard amidships that he was unable to navigate. A crowd collected and watched the doctor assist the man into his car. As he started down the street, a waggish spectator called after them: "First lemon aid for the injured," and the crowd laughed as it dispersed.



A Thomas Touring Car Making an 18 per cent Grade on the Fort Porter Hill near Buffalo

American Motor League Official Bulletin

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ANNOUNCEMENT

MOTOR AGE has been selected as the official organ of the American Motor League and by arrangement with the publisher, the paper will be sent to members of the league at the special subscription rate of \$1 per year. Subscriptions must be sent through the secretary and may in any case accompany an application for membership.—R. L. STILLSON, Secretary, 150 Nassau St., New York.

A WORD FROM THE PRESIDENT

Our membership is increasing in all directions and the league is now represented in thirty states. New applications are coming in and the work at the national headquarters is growing each day more burdensome and exacting. The formation of state divisions and of local organizations in cities and towns will relieve this condition and to the task of forming divisions and local boards we are giving every possible moment.

The national body, the state divisions and the boards of consults in the various towns will work together in a harmonious and effective way. Each local body will administer the affairs of the league within the city or town where it is located. Each state division will have its board of officers—elected from the membership—and each state board of officers will elect delegates to the national assembly, by which body the national affairs of the league are directed.

Right here, let me say to the reader that if you think you can afford to serve as one of the pioneer board of consults in your city just send your name and address to the secretary and receive from him blanks and memoranda to aid your efforts. This organization wants within its ranks every man and woman in this country who favors the use of motor vehicles, and if motor vehicles are ever to be used under laws and regulations of a sane and reasonable sort, the friends of the new vehicle must get together. Let us hear from you, not tomorrow, but now. Within the next 7 months the legislatures will be in session and it promises to be a strenuous winter for the automobile.

Now a word as to our plans and purposes. ROAD BOOKS FOR ALL STATES—The league proposes to print and publish road books for every state in the union as fast as its increase in membership will permit, and each road book will be issued free to the members within the state to which it refers. More than 3,000 pages of data—maps, distance, etc.—have already been collected for this purpose, and our first road book—containing 146 maps and covering over 3,500 miles of road distance in our most populous states—is almost ready for the press.

LAWS AND ORDINANCES—The league is collecting and compiling the laws and ordinances relating to the use of all motor vehicles, in force in our states and important cities, and will print these laws, together with leading court decisions, for the information and benefit of its members and other users of motor vehicles.

SELECTED HOTELS—The league is preparing a list of official hotels in all parts of the country, where its members may be assured of comfortable fare and courteous treatment. All proprietors of official league hotels are under contract to allow a stated discount to league members from the regular or customary rates.

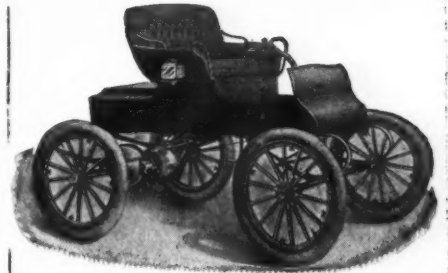
REPAIRS AND SUPPLIES—The league is preparing a list of official repair shops and supply stations in all parts of the country, where its members may be assured of courteous and skillful attention and reasonable charges. Each proprietor is under contract with the league, and in many cases a special discount is given to league members.

ITS WORK AND PURPOSE—The league is maintaining a live, vigorous and aggressive movement to make use of the motor carriage popular; to dispel public opposition and prejudice against its reasonable use; to unite all persons who are friendly to the use of the new vehicle into a strong and influential national organization.

COST OF MEMBERSHIP—We hold it to be the duty of every friend of the motor vehicle to join this league, but we do not impose any tax upon the performance of this duty. There is no initiation fee. The yearly dues are \$2 for each member or \$3 including subscription to MOTOR AGE. You are not compelled to subscribe for the official organ, but you had better. It is worth many times the price and will keep you posted in the affairs of the league.

ARE YOU A MEMBER—The "pioneer list" is now being made up. It will include the first 5,000 members and no others. In after years the pioneer's ticket will be highly valued by every holder. Every person of either sex, 18 years of age or over, of good moral character and friendly to the use of motor vehicles, may become a member. Just send your name and address with membership—and subscription—fee to the secretary.

FINALLY—Let us have your co-operation. Some of us are working early and late to build up this league and we are glad to say that the league has begun to "build." But we want your help. We cannot write a personal letter to every friend of the cause but we shall hope to have our brief say on this page from week to week, and upon that we must depend for abundant results. Fraternally.—ISAAC B. POTTER.



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Wishing you continued success, I am,

Sincerely yours,

(Signed) J. W. FOSTER.

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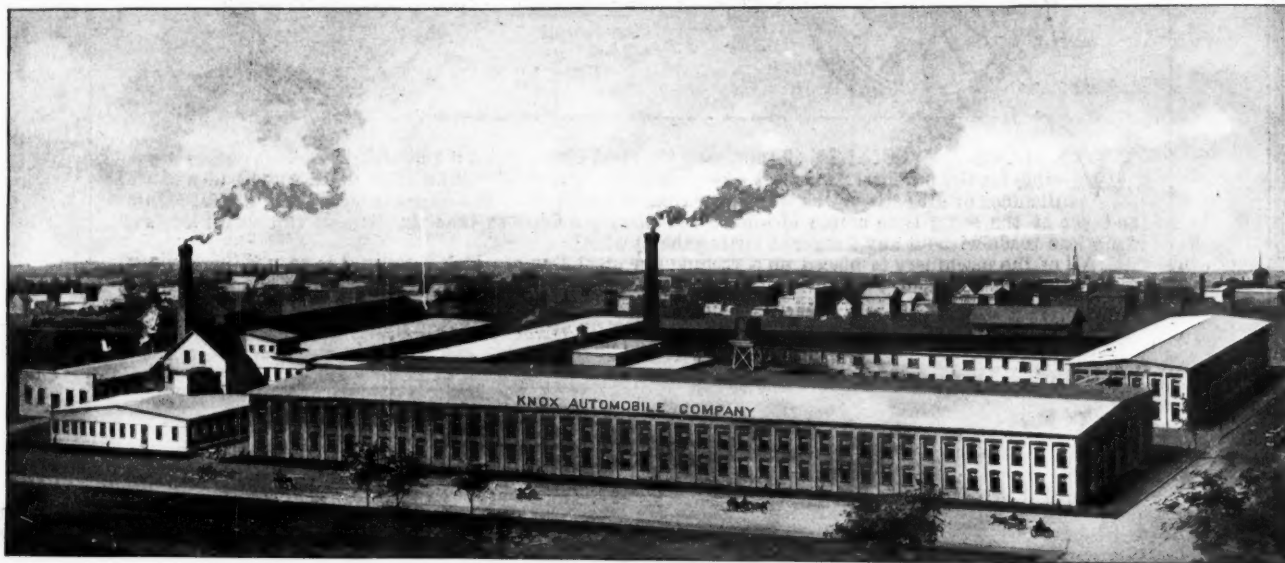
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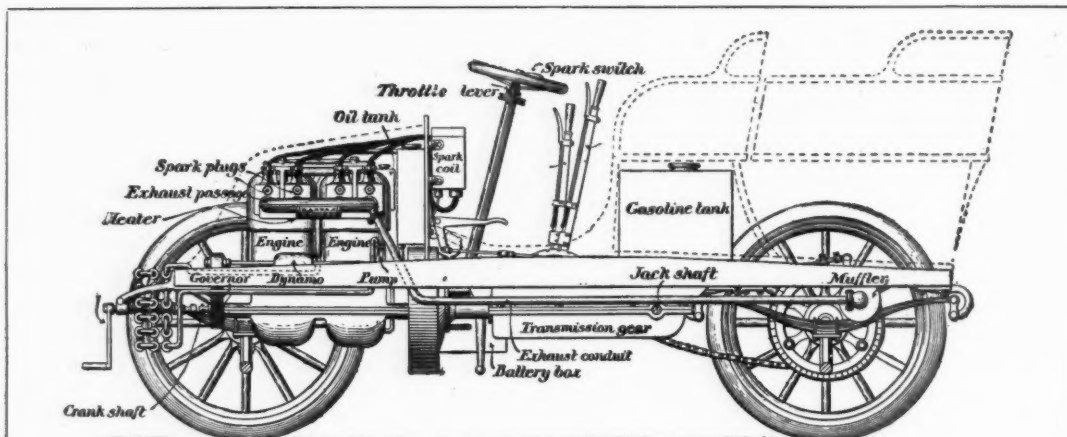
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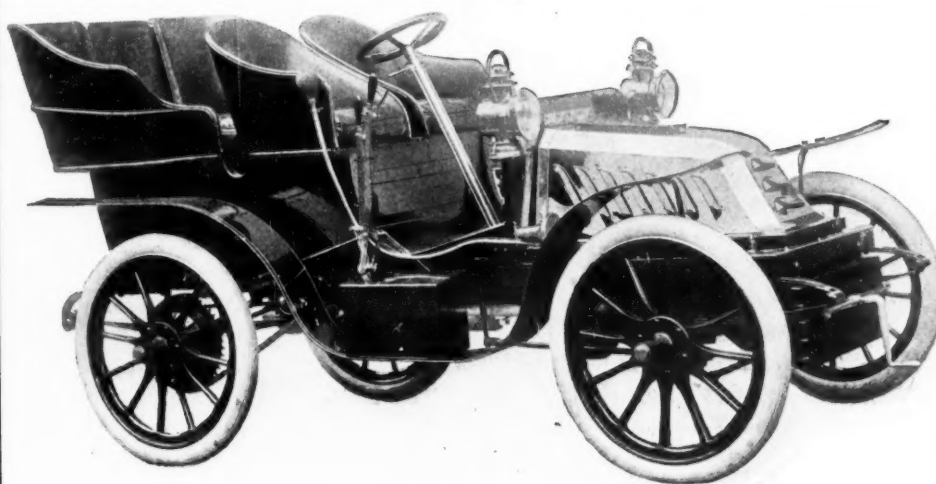
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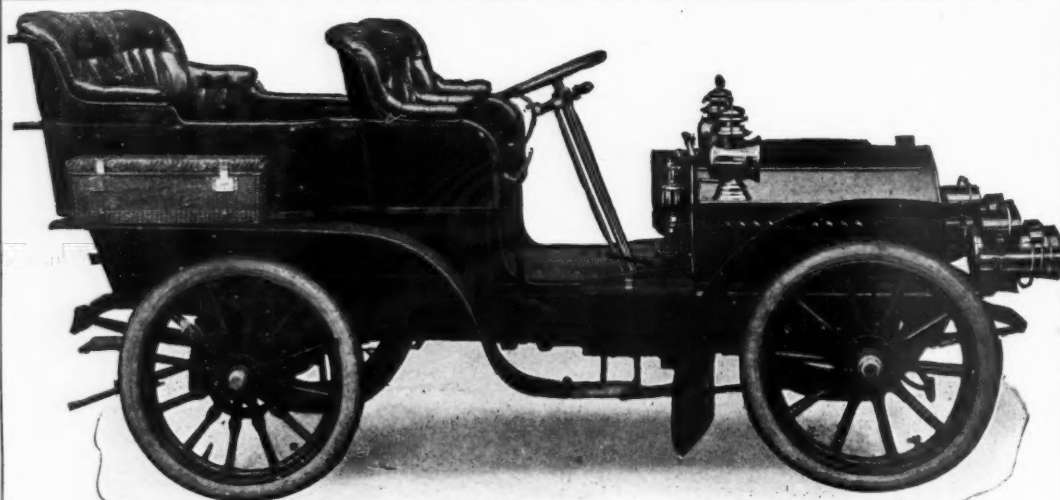
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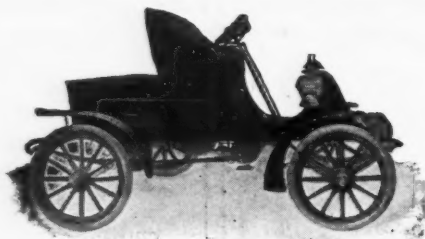
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Either engine will propel carriage should the other be cut out. (A very important fact.)

Has dynamo and storage battery. Motor will start and carriage will run on either. (Another important fact.)

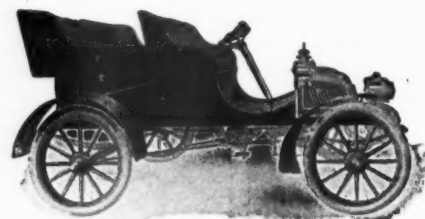
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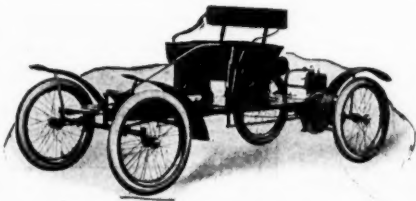
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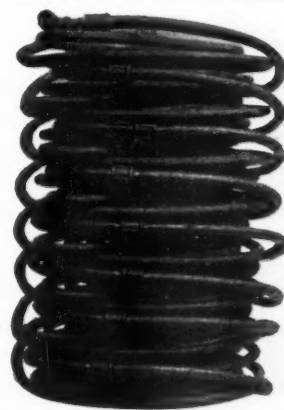
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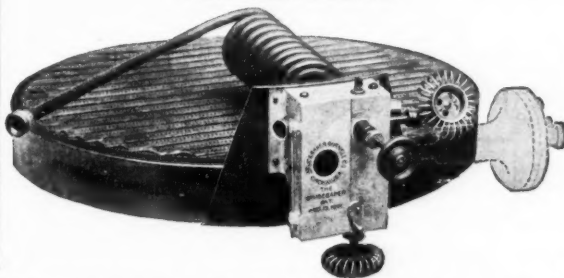
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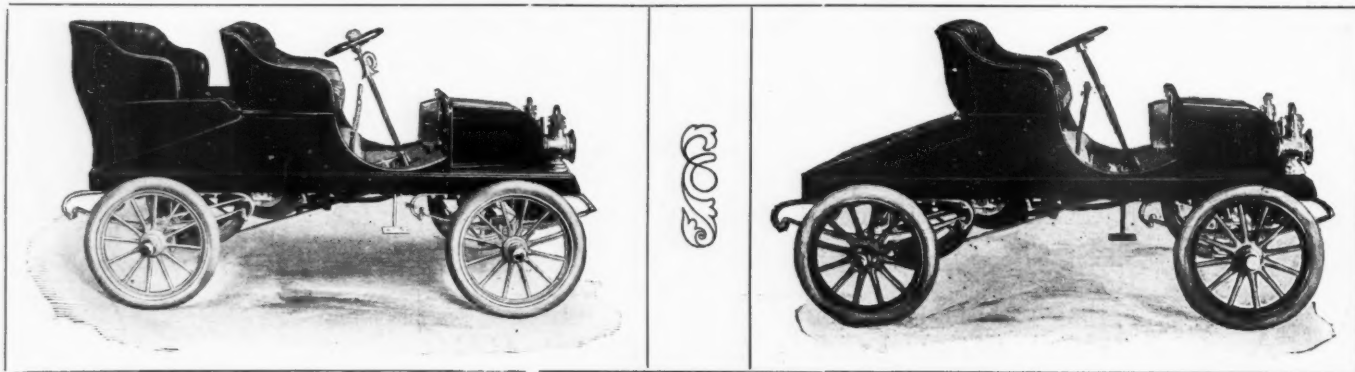
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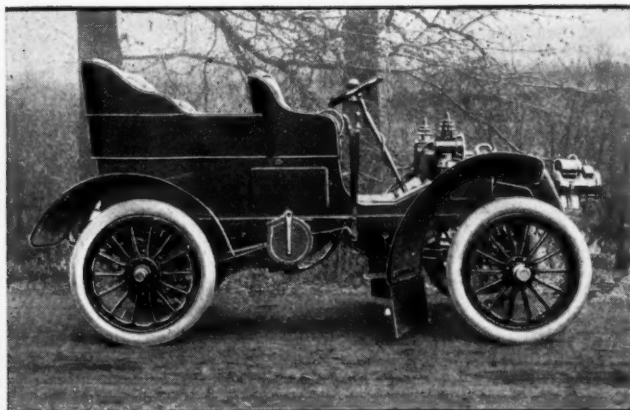
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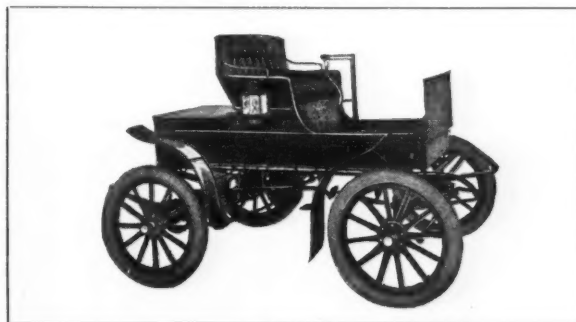
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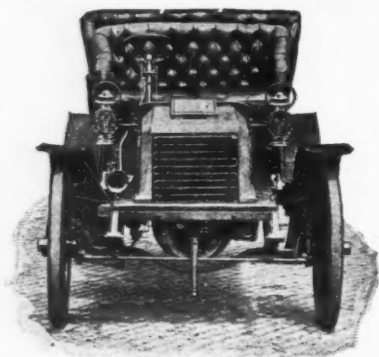
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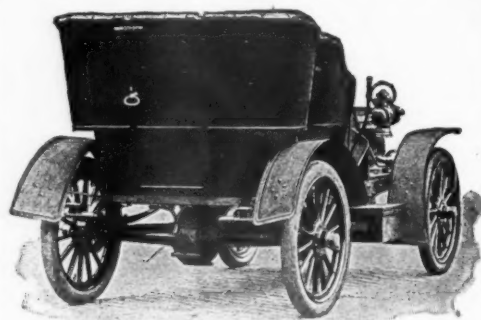
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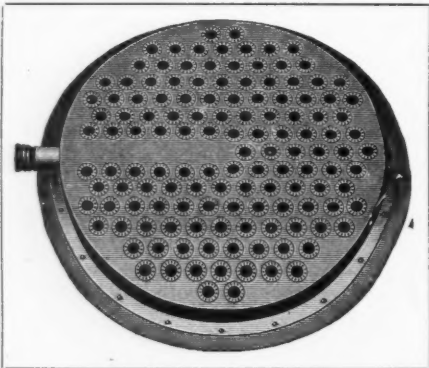
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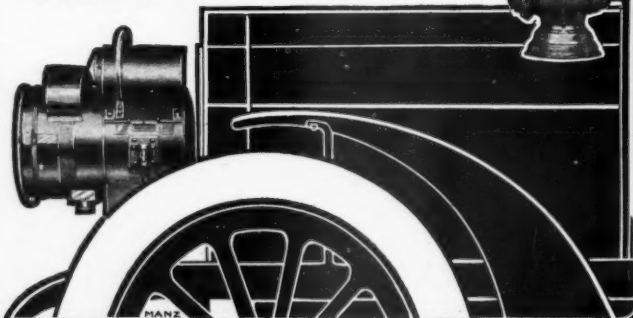
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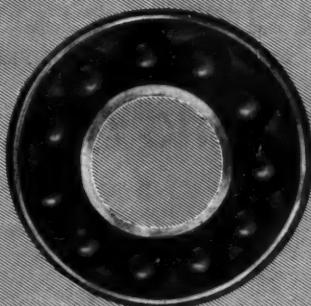
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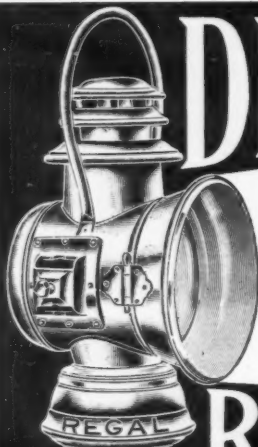
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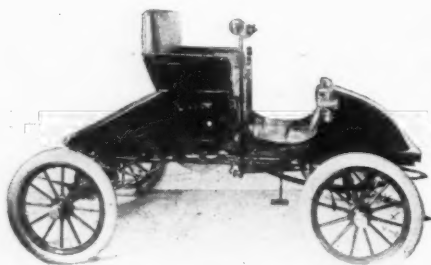
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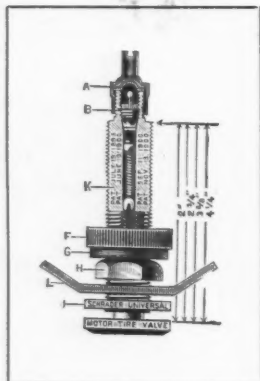
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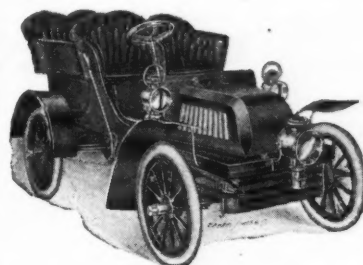
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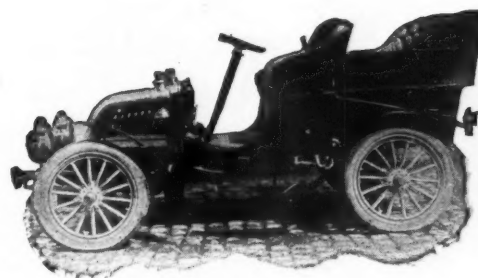
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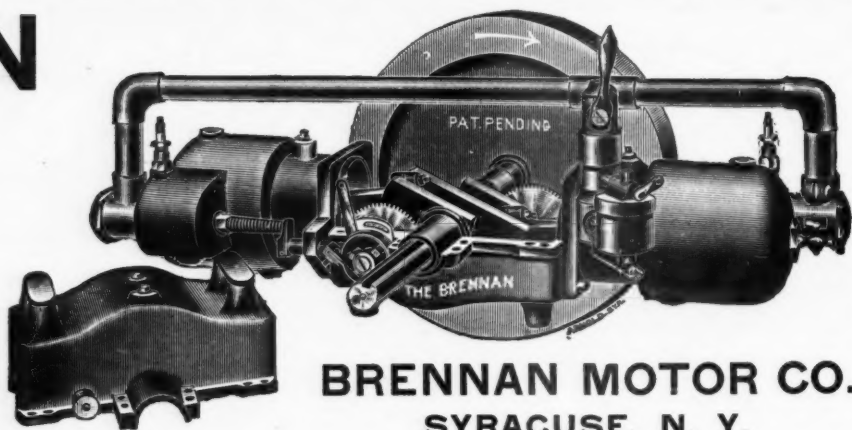
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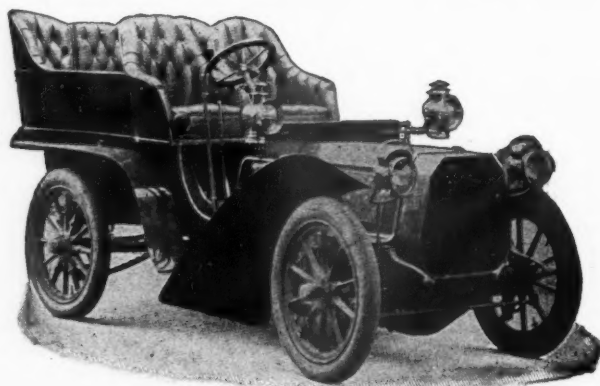
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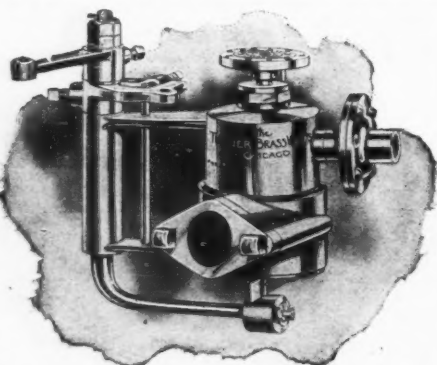
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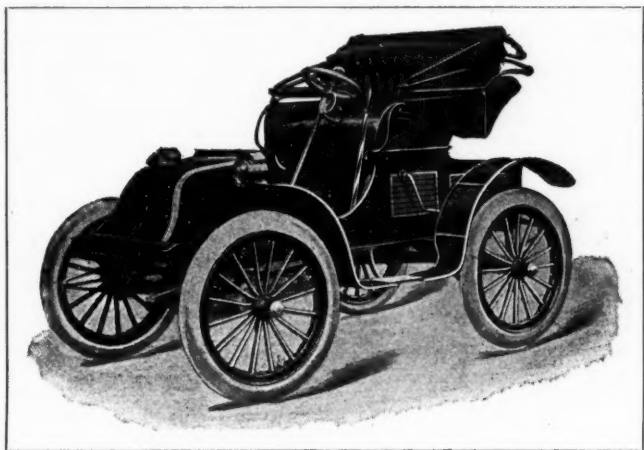
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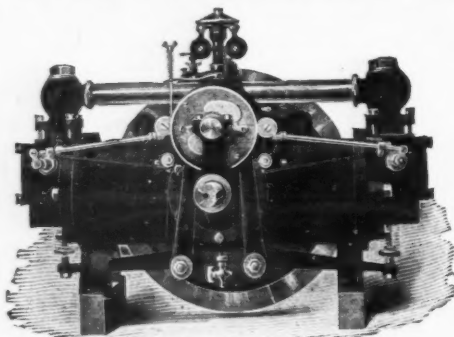
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Perfectly balanced.
Practically no vibration
Spark shifted automatically by speed of engine.
Throttling of the explosive mixture.
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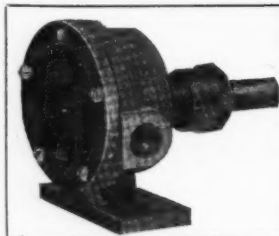
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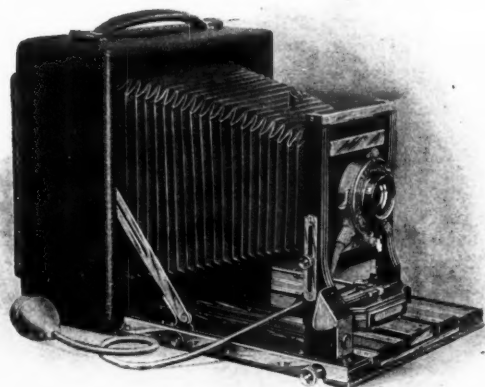
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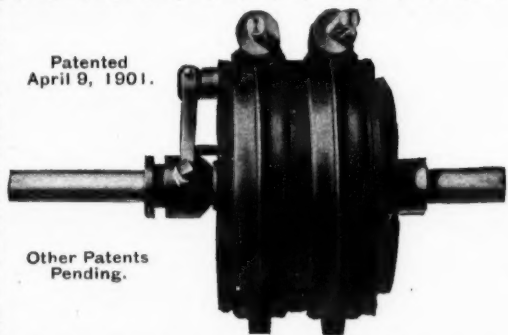
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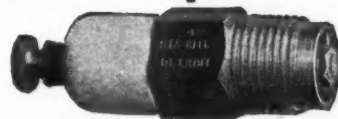
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Throttle consists of fuel needle point valve and air regulating valve, both acting together by one lever.

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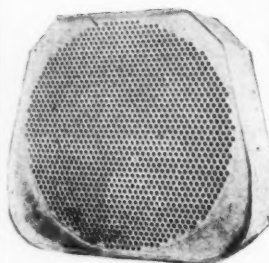
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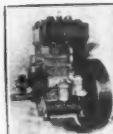
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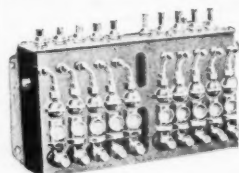
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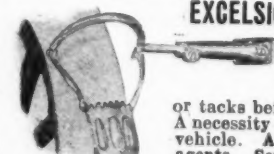


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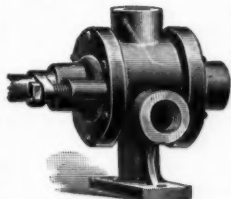
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Increases and gives a positive circulation to the cooling water for all Gasoline Motors. Simple, Cheap, Durable, Efficient, easy to apply. Over 2,000 in use.

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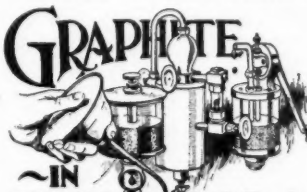
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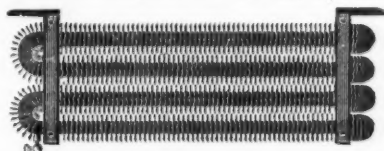
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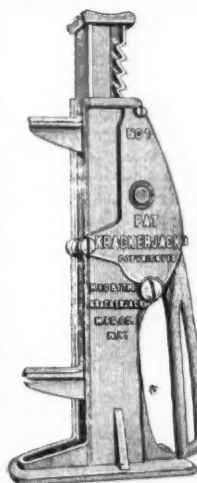


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Automatic.
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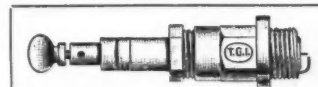
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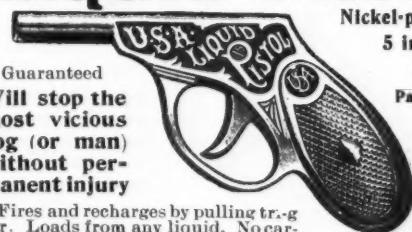
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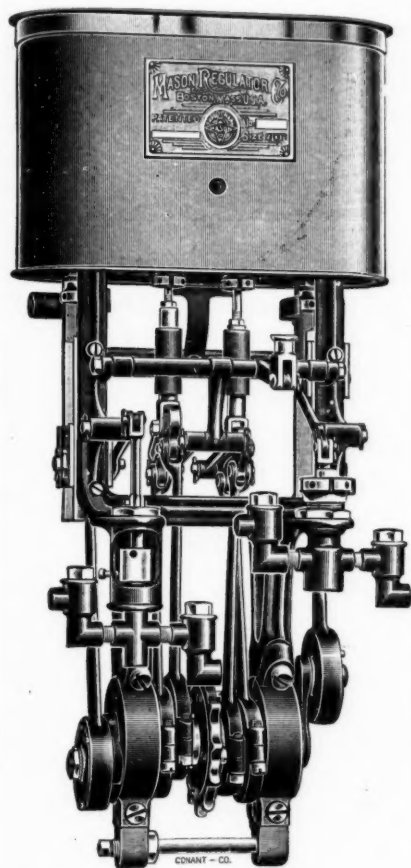
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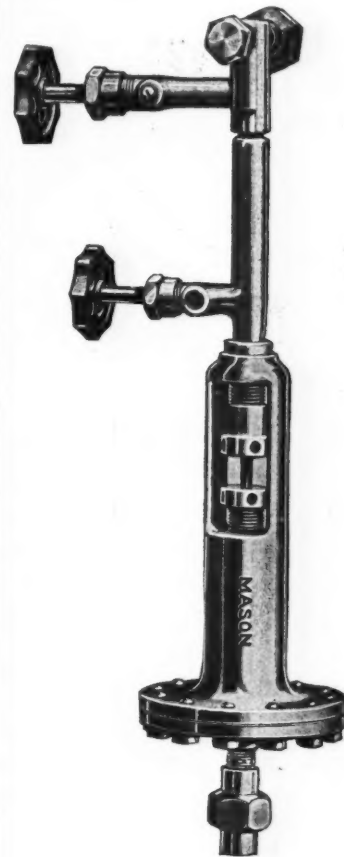
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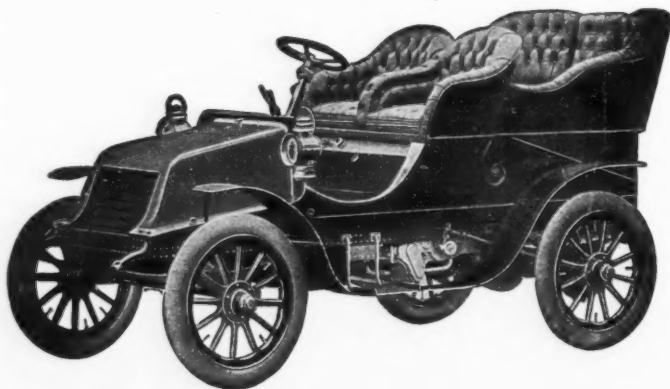
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